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AUDIO-VISUAL EDUCATION NUMBER

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EDUCATION

Vol. 68 OCTOBER 1947 No. 2

EDITORIAL

More About General Education

By CARL G. MILLER

SEVERAL years have now passed since the Harvard committee made its report and, among other things, gave added approval to the term general education. To most schools this is the big consideration.

It is strictly good procedure for many of the activities of life to use that solid method based on reason called from the general to the specific. We give the uninformed first a general view of the thing and then we proceed to specific elements. The general examination lets the learners see the huge masses and how they are put together; permits them to appreciate the immensity of the whole; impresses them with the importance of their study.

Deciding then what must be the content of general education in the elementary school, general education in the high school, and general education in the liberal arts college remains the big problem. There is so much that might be included. There is so much to be lost by including the wrong things or too much.

In America the keynote of general education has to be preparation for good citizenship. Few will deny that objective. But immediately we run into difficulty on interpretation of that term. For example, is vocational education a part of it? Some will say it is because a good citizen has to have the ability to earn his living. It appears, however, to be specific education, not general; therefore should follow general education. The nation needs healthy citizens who can express themselves and who have understanding of our democratic form of government and its problems. Around health, around numerous fundamentals that will bring civic understanding, and around the fundamentals of effective expression should the curriculum for general education in the common schools be built.

If it is true that general education is what we ought to give the youth of America (and perhaps that's all the taxpayers' pocketbook can afford if a really good job is done), then this matter of guidance loses value in the perspective. Boys and girls should be given a good general education: that is their guidance. Who does the guiding then, for the most part? The curriculum builders, to be sure. Elective

subjects will be a decided minority. Every subject will have a certain amount of guidance value, and it is doubtful that special teachers and special programs on guidance are needed. Let the teachers teach. Such a course as vocational guidance should come after general education.

For general education we need some test questions as we formulate the curriculum. One certainly is: Is this course really general and not specific? Another is: Does this course represent a fundamental preparation for that effective participation in American government expected of every citizen? A third one could well be: Does this course avoid being one that leans so far toward the development of the individual that the mutuality of him and his government is almost lost sight of? Others need to be formulated. The important thing is to check most rigidly the content of what we call our general education, then really put that over.

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Teacher Training *in* Audio-Visual Instruction

By F. DEAN McCLUSKY
University of California,
Los Angeles, California

THE audio-visual movement in education has been retarded since its beginning by the lack of teacher education in the philosophy, methods, and techniques of audio-visual instruction. In an article published in the *Educational Screen* in April and May 1925, the author stated that, "If teachers are to . . . make use of visual aids they will first have to be shown how to use them in the classroom. Courses of study in visual instruction will have to be made a part of the curriculum in teacher training institutions. Teachers will have to be trained to teach the normal school courses. Textbooks will have to be written . . . and published before visual instruction will be accorded true academic recognition."[1]

At the time this was written there were few courses being offered in institutions of collegiate rank in the field of visual education. The *Visual Education Directory 1923* published by the National Academy of Visual Instruction listed 17 educational institutions which offered courses in visual education during the academic year 1922-23. While this group of institutions was but a small percent of the scores of colleges, normal schools, and universities of recognized standing throughout the country which offered professional courses for teacher, the list did include a number of the finest universities and teacher training schools in the country. However, not one of the schools and colleges pioneering the audio-visual aspect of education prescribed the course in visual instruction. Three of the courses listed were offered by correspondence study or in extension and practically all of the courses were offered in summer session only. During the past twenty-two years a similar pattern of teacher education in audio-visual methodology has typified the formal training program. While the number of institutions offering courses has increased ten-fold since 1923,[2] it has only been recently that courses in audio-visual instruction have found their way, to any appreciable extent, into the winter session curricula of colleges of education.[3]

It is little wonder, then, that two

1 Frederick Dean McClusky, *Growth Through Teacher Training*, The Educational Screen, Chicago. Vol. IV, Nos. 4-5, April and May 1925. p. 203.

2 The Directory for the National Academy of Visual Instruction for 1931 listed 86 institutions of higher learning as having offered courses in visual instruction during 1930-31. The number of institutions currently offering courses in audio-visual instruction is estimated to be 175.

3 The one exception to this statement is the State of Pennsylvania where for over fifteen years a course in audio-visual instruction has been required for the teaching credential.

surveys completed in 1946 report that teachers are the stumbling block to progress in the systematic use of audio-visual materials in our schools. Western Illinois State Teachers college at Macomb, reporting a study recently completed, states, "The failure of the teacher to consider and use the audio-visual aid as a regular part of the instructional procedure has long been one of the factors retarding further development of the audio-visual program in the public schools. This survey reveals that in 647 schools or school systems the lack of training in the utilization of these materials hinders further development."[4]

Similarly, the recent survey made by the Research Division of the National Education association reports that, "The obstacle to success named more frequently than any other was the disinterest on the part of classroom teachers or inability on their part to select and use audio-visual materials in an effective way. If this is true—and the conclusion finds support in most of the recent literature on the subject—a tremendous program of teacher education is indicated which will include both specialized instruction in the colleges of teacher education and locally arranged programs for on-the-job training."[5]

Assuming then that extensive teacher education in audio-visual instruction is desirable, how can such training be provided? Are summer session courses the answer? Is attendance at short courses and conferences sufficient? The writer called attention in 1925 to the several ways in which teachers were being trained in the techniques of visual instruction.[6] These methods were listed under three major headings: (1) formal instruction provided by institutions of higher learning through credit courses offered in summer session, regular session, or extension; (2) semi-formal training such as that gained through teachers' institutes, short non-credit courses, a series of conferences, a lecture program, or systematic in-service training through supervision, and (3) informal instruction gained by reading, by attending occasional lectures, by going to occasional conferences, by witnessing demonstrations, and by listening to sales representatives. In 1925 it was clear that, "The growth of visual education (was) in no small degree due to the spread of information by informal methods . . ."[7] But it was also clear that systematic formal instruction was much more to be desired.

The National Academy of Visual Instruction[8] in a two-day session at its 1932 meeting sought an answer to the problem of teacher education. It ended its deliberations by passing unanimously a resolution which stated, "That effective visual-sensory techniques require special preparation, that responsibility for this preparation rests with teacher training institutions,

4 *The Functions of an Audio-Visual Department in a Teacher Education Institution*, by the Audio-Visual Committee, Western Illinois State Teachers College Bulletin, Macomb, Ill., Dec., 1946. Vol. XXVI, No. 4, p. 11.

5 *Audio-Visual Education in City-School Systems*, Research Bulletin, National Education Association, Washington D. C., Dec., 1946. Vol. XXIV, No. 4, p. 165.

6 Op. cit., p. 272.

7 Ibid., p. 273. This observation was based on a national survey of the administration of visual education made in 1923-24 by the writer for the National Education Association's Committee on Visual Education.

8 Later merged with the Department of Visual Instruction of the National Education Association.

that a laboratory course in visual-sensory techniques should be mandatory for teachers in training, that teachers in service should be encouraged to take it, that the course should be separate, and that the course should carry semester hours credit."[9] The stand taken by the members of the then largest professional group in visual education in the United States was helpful in curbing the *laissez faire* attitude toward teacher training in visual instruction but it was not successful in establishing the program recommended. The need for a broad systematic program is still present.

The Macomb committee reports as a result of its 1946 study that, of the schools or school systems contacted, "128 favored the formal course in universities and colleges; 239, the extension course conducted by the colleges and universities; and 504, the short, informal, non-credit course."[10] In commenting upon this expression of opinion, the Macomb report goes on to say, "This does not necessarily mean that the formal courses as now conducted in many institutions do not have a definite place. It does indicate, however, that the immediate need is for an extensive in-service training program."[11]

The position taken by the Macomb committee is clearly that they consider the time factor to be important, and therefore urge a type of instruction that can be put into immediate effect for teachers in-service. The committee infers that the offerings in formal courses will train the oncoming generation of teachers provided enough courses are offered and all take them.

In recognition of the need for widespread teacher education in audio-visual instruction, the California State Board of Education has issued the following ruling which reads in part: "Institutions to be considered for approval to offer the training and to make the recommendation for the kindergarten-primary, general elementary, junior high school, general secondary and junior college credentials must, effective July 1, 1947, maintain a course, or the equivalent, of at least two semester-units in value in audio-visual-radio education and require that such course be successfully completed by each applicant for one or another of the credentials listed above."[12]

In order to guide teacher education institutions in their efforts to comply with this requirement, the Superintendent of Public Instruction in California, Roy E. Simpson, appointed a committee of 26 educators in colleges, in universities, and in selected school systems to prepare a statement on teacher competency in the field of audio-visual education.

This statement outlines in precise terms: the meaning of audio-visual education; objectives in educating teachers to use audio-visual materials in terms of knowledge, understandings, skills and abilities; outcomes from the study of audio-visual education; and guides for the evaluation of teacher-education programs in audio-visual education. It is presented as "an instrument to be revised

9 Minutes of the February 1932 meeting of the National Academy of Visual Instruction. Held at the National Press Club, Washington, D. C.

10 Op. cit., p. 11.

11 Op. cit., p. 11.

12 *Developing Standards of Teacher Competency in Audio-Visual Education*, A Committee Report. California State Department of Education, Division of Audio-Visual Education, Sacramento. December 9, 1946.

continually in the light of new information and experience."[13] The California committee in preparing its report drew upon the experiences of its members, considered the content of courses in audio-visual education offered in selected colleges and universities outside of California, studied the returns from a questionnaire circulated by the Audio-Visual Aids committee of the California School Supervisors association, and examined a preliminary statement on the same subject prepared for the American Council on Education.

Some of the arresting statements in the committee's report are:

"The Meaning of Audio-Visual Education

"Audio-visual education refers to the carefully planned and integrated use of a wide range of materials in teaching from the kindergarten through the college . . . .

"Modern educational objectives require improvement in instructional materials and practices, and the dynamic nature of these materials themselves—their content, organization, and manner of presentation—assure that, when wisely used, they will clarify concepts and make learning more meaningful and efficient . . . .

"Because radio, motion pictures, filmstrips, transcriptions, and other audio-visual materials can bring the world, past and present, vividly and concretely into the classroom, they are a means of insuring education against isolation from life. These materials also serve as mediums of modern communication to present current problems and issues. Through the use of audio-visual materials in the classroom for this purpose, learners can improve their study of these problems and their competency in solving them, thus increasing their experiences in citizenship and developing the understandings and attitudes necessary for democratic living.

"Audio-visual education, then, is a modern way of teaching and is in harmony with modern educational thinking . . . .

"Objectives in Educating Teachers to Use Audio-Visual Materials

"The teacher is and must always be an essential element in any concept of education. The utilization of audio-visual education materials calls for more rather than less preparation and participation by the teacher.

"To realize the values inherent in audio-visual instructional tools, the teacher must have certain knowledge, understanding, skills, and abilities . . .

"Outcomes From the Study of Audio-Visual Education

"A teacher who has gained a working knowledge of the materials and methods of audio-visual education will recognize that there is no 'one best way' to use audio-visual materials and that new methods of use are continually being developed. He will be aware that more and better materials are needed and feel a responsibility for making constructive suggestions to producers. He will be alert to find or create audio-visual materials which will contribute directly to his classroom needs . . .

"Such a teacher will be aware of the fact that many students cannot learn as easily from the printed word

13 Ibid., page 1.

as from other means, and will be able to provide suitable audio-visual materials from which students can learn. He will know, too, that production and use of certain audio-visual materials by the students often constitute in themselves valuable learning experiences."[14]

It will be observed on reading the previous statements that the implications for teacher training in audio-visual methodology are far reaching. The California plan begins at the grass roots, namely with the teachers of teachers, for it does not stop with the single two-semester hour credential requirement. Rather it moves into all teacher education courses in recognition of the old saying that one teaches as one has been taught.

The full impact of the two-hour audio-visual requirement upon the teacher training institutions in California was felt this summer. Reports from colleges and universities show that enrollments in the summer session audio-visual courses have been high. The figures run 90, 114, 85, 264, *et cetera* for individual institutions. This has placed a strain on staff and equipment. Directors of audio-visual programs in school systems have been used extensively as instructors thus tying practical field experience with the academic. The California State Department of Education through its chief of the Division of Audio-Visual Instruction, Francis Noel, has rendered valuable service in advising and coordinating efforts. California's teacher education program in audio-visual instruction has started in an auspicious manner and its progress will be closely watched by educators throughout the nation. The ultimate outcome of the effort should be a substantial up-grading of teaching in the state.

Parallel with the state department's program in teacher education, the University of California at Los Angeles and the University of Southern California are developing audio-visual courses which carry the student beyond the minimum requirements. For example, this past year four courses were offered by the University of California at Los Angeles: a specialized laboratory upper division course given for vocational teachers,[15] a survey course at the upper division level designed to meet the credential requirement, a problems course offered at the same level, and a graduate seminar open to advanced students. An additional seminar at the graduate level will be offered, beginning with the 1947 fall semester, making it possible for the student wishing to specialize in audio-visual instruction to take a total of 15 semester hours in the field. The University of California's audio-visual teacher education program is designed to train teachers, administrators and specialists, and to carry on the basic research needed to guide teachers in the creation of new techniques of teaching with audio-visual materials and to acquaint administrators with the best procedures for the conduct of an audio-visual program.

University Extension plays an important role in the audio-visual program of the University of California. In addition to maintaining a large

14 Ibid, pp. 2-4.

15 The article, *Industrial Teacher Training and Audio-Visual Education*, by M. L. Barlow which appears in this issue of EDUCATION outlines the current approach to the course for vocational teachers.

film library at Berkeley and at Los Angeles, Extension also offers courses in audio-visual instruction which augment the teacher training program.

The development of course content in audio-visual education poses an important problem. The value of the instruction depends chiefly on the content and technique of presentation. One danger is that interest in the mechanics of operating machines is permitted to over-balance principles. If this happens, trained gageteers are the product rather than trained teachers. Another danger lies in making the content and procedure too academic. Above all else, the audio-visual course should exemplify in technique of presentation the principles which it professes to teach. The report of the committee of 26 of the state department represents a balance between principles and skills. It also stresses a functional approach. The committee has rendered a major service in setting the guide posts for the courses which are being taught in teacher training institutions.

Once the guide posts are clear, then, the interests of teachers and students taking the courses may be determined and blended with the major units to be taught. Edgar Dale[16] reports that this procedure has been employed at Ohio State university. Likewise it is being used by Donald Doane at the University of Southern California and in the courses at the University of California at Los Angeles. For example, at UCLA over 2000 statements of interests have been collected from students and teachers. During the 1947 summer session, the 243 students enrolled in the survey course were divided into subject matter interest groups and prepared a handbook of 130 mimeographed pages in which many of their questions are set forth and answered.

All of the following articles in this issue of EDUCATION are outcomes of the audio-visual teacher education program in the state of California. Elizabeth Goudy Noel and James McPherson served as members of the California State Department of Education's committee of 26 and they have taught courses in audio-visual education for several colleges and universities. Lindop, Barlow, Keefauver and Ford have all taken one or more courses in the audio-visual field at UCLA during the past year. The writer feels that the presentation of this material, therefore, not only has intrinsic value in itself, but will also serve as part of the record of a teacher education program which will more and more attract attention throughout the nation as time progresses. If, as was indicated at the beginning of this article, the lack of trained teachers in audio-visual techniques is an obstacle to progress, then reports of the type represented by this issue of EDUCATION from other sections of the United States would help in resolving the problem.

16 Edgar Dale, *What Do They Want to Know?* Educational Screen, vol. XXVI, No. 6, June, 1947, p. 302.

Educational Psychology *in* Audio-Visual Instruction[1]

By BOYD LINDOP

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VISUAL instruction, paradoxically, is both old and new. We find among the forerunnners of modern education such men as Comenius, Rousseau and Pestalozzi emphasizing visual aids. We may trace visual instruction back to primitive picture records drawn by cave men. Yet the manufacture and use of audio-visual materials as we know them today is a relatively new field in education. Audio-visual education is still close to the experimental stage, the first scientific studies having been made by Weber, Freeman and McClusky in the early 1920's.

The value of audio-visual aids in teaching has been demonstrated, but individual materials such as slides, motion pictures, recordings, etc. vary as greatly in quality as in effectiveness of teacher use. Some of the producers or manufacturers who have entered the field hoping to make money know little or nothing about the learning process. Worse, some of the teachers and administrators who use the aids seem to forget their training in educational psychology when audio-visual materials enter the school or classroom. Audio-visual aids are simply *aids*. They do not replace the teacher or substitute for teaching. They do not eliminate the need for applying sound principles of educational psychology.

When the producer doesn't know educational psychology, we have poorly designed movies or other audio-visual materials which only discourage teachers who are looking for something of value. When the administrator doesn't apply his educational psychology, we find a whole school, regardless of grade level or subject, going to the auditorium for a purposeless "educational" movie. When the teacher forgets her educational psychology, we see her running into another teacher's room a few minutes before class begins, or even as roll is being checked, to report that a movie whose title she probably doesn't even know is being shown in the visual room: would the teacher and class care to come see it?

Audio-visual aids should be used for learning. They should not be used as a refuge for the teacher who, as one graduate student put it, has "abdicated her reason and taken refuge in a fox hole at the back of the room."

The same rules of learning apply to audio-visual teaching as to any other teaching. Accurate models for imitation are probably more important than accurate word descriptions. Care-

1 This article is an extension of ideas and principles discussed by F. D. McClusky in his visual education classes at the University of California, Los Angeles.

ful review and repetition is just as effective in seeing pictures as in reading a text. Yet how often does the average teacher use accurate models? How often does she show a still picture or slide to her class for more than a few brief seconds? How often does she have more than a single showing of a motion picture?

If audio-visual aids are to be used for learning and not for mere entertainment, there are at least six main principles to be kept in mind by the manufacturer who produces the aid and by the teacher who uses it. Several of these principles have been expanded into schools of methodology. All six are established concepts, accepted by students of the field of educational psychology.

They are:

I. Individual differences
II. Self activity
III. Interest
IV. Apperception
V. Gestalt or pattern
VI. Simultaneous learning

Naturally, in the space of a single article we cannot fully discuss any one of these principles. Students of educational psychology know that volumes have been written about them. Our more reasonable purpose, then, will be to discuss these concepts by showing their relation to the production and use of audio-visual aids.

Individual Differences

The beginning of Binet and Terman's scientific measurement of intelligence and the study of intelligence, interests and abilities by E. L. Thorndike and others, early in this century focused attention on the many differences between individual students. The principle of individual differences, clearly established and demonstrated by their pioneer work, has become one of the most widely discussed and practiced of modern ideas of education.

Differences in reading ability and general academic intelligence are perhaps the most frequently measured differences between pupils. Edward Krug summarizes the wide range of individual abilities in these words:[2]

"Studies have shown that in an average group of ninth graders, for example, the reading ability will range from third or fourth grade level to that of twelfth or thirteenth. Even at college level this wide variation exists. In one study reported by Horn, the median college freshman was found to read no better than the upper 15 percent of the ninth grade tested, and ten percent of them could not read as well as the median ninth grader."

Individual differences in rate of growth and speed of maturation between the sexes are equally obvious. Girls mature, as a group, earlier than boys and consequently have more mature interests. In addition, the range of chronological age in any one class may be as great as four or five years, with the children in each age group showing different degrees of maturity. It is obvious that for the early years of adolescence at least, the teacher must furnish a wide variety of instructional materials.

Other individual differences probably are less discernible than those of academic ability and physical growth.

2 E. Krug. *Individual Differences.* Ch. I, Fifteenth Yearbook, National Council for Social Studies, 1944. P. 15.

The teacher and the producer of teaching materials, however, should not overlook differences in home background, family tradition, health, emotional balance and adjustment, habits of work, and interests and drives. Too often we neglect these differences. Moreover, too often we entirely ignore equally important differences in the children's social experience, their ability to take responsibility, their attitude toward authority, and their many other attitudes: liberalism or conservatism, tolerance or non-tolerance.

An interesting area for more intensive study in individual differences lies in the fact that some people, teachers usually included, find the use of language and verbal expression easy. Other people have little facility for expressing themselves in language, and tend to be "thing minded." For students in this latter category, the use of visual materials may, in certain cases, mean the difference between success and failure, as F. D. McClusky has shown in his Michigan syllabus, *Visual-Sensory Instruction in the Modern School*:

"There is a notion, substantiated in part by experience and by some research, that the generous use of visual-sensory materials in classes tends to reduce the number of school failures. Brighter students seem to excel in understanding abstractions while these same ideas have to be made concrete for the slower pupils. Of course, in the distinction which we have given here between brighter and slower pupils we refer to the most common distinction which is mainly a difference in the facility of the use of language. Visual-sensory materials are helpful in making language abstractions concrete and open up a new avenue of approach in teaching students who seem to be unable to learn quickly with abstract or verbal images."[3]

Obviously the teacher should permit each individual in the class to proceed most effectively in terms of his own abilities, and not impose the teacher's own pattern of verbal expression. Traditional education has attempted, and some traditional schools are still attempting, to make all students conform to a single pattern, measuring success chiefly in language facility. John Dewey has long taken reactionary education to task for this tendency, writing:

"A truly scientific education can never develop so long as children are treated in the lump, merely as a class. Each child has a strong individuality. . . . Every pupil must have a chance to show what he truly is, so that the teacher can find out what he needs to make him a complete human being. . . . If the pupils are marched into line, information presented to them which they are then expected to give back in uniform fashion, nothing will ever be found out about any of them. But if every pupil has an opportunity to express himself, to show what are his particular qualities, the teacher will have material on which to base her plans of instruction."[4]

To interpret these ideas in terms of using specific audio-visual materials: Those who are "thing minded" deserve the opportunity to express themselves

3 F. D. McClusky. *Visual-Sensory Instruction in the Modern School.* Ann Arbor, Brunfield, 1940. P. 13.

4 John and Evelyn Dewey. *Schools of Tomorrow.* New York, E. P. Dutton & Co., 1915. Pp. 137-38.

in sketches or cartoons, flow-charts, graphs or diagrams, models or slide pictures. Expression should not be limited to speeches or essays.

D. C. Knowlton's *Making History Graphic* (New York, Scribners', 1925) contains some good examples of pupil-made graphs, cartoons, time lines, and the like. In addition, a larger selection of manufactured visual-sensory materials is continually becoming available. It is the teacher's responsibility to use this material in organizing a wide variety of learning situations which will offer something, or have some appeal to each and every individual in the class.

William Hartley suggests a few of the ways in which the alert teacher can use audio-visual aids to provide for individual differences within the frame of class work:

"Each pupil should be encouraged to find some socially acceptable manner in which he can contribute to the knowledge of the class. The artistically inclined can recreate the pageant of the past, or may picture the current scene. The boy whose hobby is photography may present a pictorial study of housing as he has snapped it. The young craftsman may produce authentic models. The boy who is always sketching may draw original cartoons. The amount of such work that can be produced is limited only by the amount and variety of talent available and the teacher's skill in ferreting it out."[5]

Standardized and unimaginative teaching formulas are severely criticized by Hartley, as they should be by all teachers:

"Too long the only followup activity in connection with school trips has been a teacher-required essay on 'What I Liked Best on Our Trip.' A well drawn plan of an historical site, a poem written after a visit to the slums, or a series of pupil-made photographs may show even more penetration, synthesis or factual knowledge than the essay."[6]

Individual differences call for individualized instruction which will give each pupil, whether verbal or thing minded, the chance to add to group knowledge in his own way.

Even "brighter" children's concepts become more accurate and explicit when good audio-visual materials are properly used and verbalization reduced. Explicitness, accuracy of impression, and the reduction of verbalism may be of greater importance in the lower grades than teachers have thought; they are certainly of great importance in certain special classes.

"The aids may be especially helpful to the slow learner or to the foreign-born child who often has difficulty in making the verbal responses expected from the class. . . . It is possible that in many instances audio-visual aids contribute directly to vocabulary development."[7]

In addition to aiding in the formation of explicit and accurate concepts and to giving special assistance to the non-verbal child, audio-visual materials may fill in gaps in individual information, giving the class a common background on which to build. Careful class study of a few projected slide pictures, during which sessions matters of time of day, height, distance,

5 William H. Hartley. *The Use of Audio-Visual Aids in Individualizing Instruction*, Ch. XIII, Fifteenth Yearbook, National Council for Social Studies, 1944. Pp. 108-9.

6 *Ibid.*, p. 103.

7 *Ibid.*, p. 102.

color, lighting, and interpretation of temperature, sound and odor may be discussed, is an excellent socialized project for filling in informational gaps and giving something of the experience of an actual visit to the locale in the picture. Moreover, such careful study is the easiest way to overcome the reaction that picture materials are mere entertainment, thus making the pictures true aids to learning.

Audio-visual aids, finally, may be used to free the individual pupil from the viewpoint of one textbook or a single teacher. Margaret Harrison in her *Radio in the Classroom* discusses the many conflicting viewpoints which are broadcast in such programs as the Chicago Round Table. Hadley Cantril and Gordon Allport in their *Psychology of Radio* point to radio's wonderful freedom from provincialism, its amazing ability to make the world its stage.

Audio-visual materials should be designed to teach the individual student that there are many viewpoints on major problems; that he must search for truth by critically evaluating what he sees or reads; that he should do this for himself and not take ideas ready made by propagandists.

If we accept the evidence of individual differences, then, and believe in democratic education, we must provide and use audio-visual aids to education for they help the individual to learn, and they help the teacher to understand the individual. They will, if carefully used, give the teacher data on individual differences and allow him more time to study the individuals in his class.

It is our opinion that audio-visual materials will play an increasingly important role in the schools of the future. They should play a definite part in helping to solve the administrative problem of dealing with large masses of children while giving each child the special attention and work he needs.

Thus we have indicated, briefly, that audio-visual materials can provide for individual differences in the classroom and permit the teacher to study her individual pupils. Concluding this section are several specific rules for teachers and producers of audio-visual materials based on the concept of individual differences.

1. Gear audio-visual materials to the capacity of the pupils. We have seen motion pictures intended for the lower grades which use senior high school vocabulary and organization.

2. Use a variety of audio-visual aids. The teacher or producer who claims that any one aid, such as the educational motion picture, is the final answer to any educational problem is showing poor judgment and ignorance of individual differences.

3. Plan a variety of patterns in the use of audio-visual materials, and do not insist that individual students conform to any single pattern.

4. Do not make the mistake of using the materials in haphazard fashion, without planning.

5. Use audio-visual aids in studying individual pupil differences.

6. Use audio-visual aids, except on rare occasions, to teach, and not merely to entertain.

If the producers who manufacture audio-visual materials and the teachers who use the materials will keep these six rules in mind, individual differences—one of the basic factors

in modern education—will receive proper attention.

2. *Self Activity*

Self activity is a second fundamental law of learning which must be taken into account by the teacher and producer. It is a psychological principle which was stressed by Froebel and has received attention from most leading educators since his time. William James has summed up the principle and its importance in these words:

"One general aphorism emerges which ought by logical right to dominate the entire conduct of the teacher in the classroom.

"No reception without reaction, no impression without correlative expression,—this is the great maxim which the teacher ought never to forget.

"An impression which simply flows in at the pupil's eyes or ears, and in no way modifies his active life, is an impression gone to waste. It is physiologically incomplete. It leaves no fruits behind it in the way of capacity acquired. . . . Its *motor consequences* are what clinch it. . . . The most desirable impressions are those on account of which we speak or act, or else are inwardly convulsed."[8]

The implications of these words for audio-visual teaching are obvious although often criticized on the grounds of pupil passivity.

Children learn through their own experiences and responses and throughout life, whenever we engage in activity, we are learning. Our learnings may be sensory-motor or associative, they may be problem-solving, or they may come through pure enjoyment in play. In each case they involve activity, whether that activity takes on physical (sensory-motor) aspects, intellectual aspects such as associative learning and reflective thinking, or emotional aspects such as enjoyment or distaste.

If our aim is learning which will help to develop a balanced social personality, we must stress activity and expression, and not mere passive reception. We learn to dance by dancing; we learn to memorize poetry by memorizing it; we learn to solve mathematical problems by solving them. If we want children to make effective progress in learning we must keep them actively at work, and the materials with which they work should be stimulating and hold their attention and interest.

Audio-visual materials can do a great deal to arouse children's mental activity. F. D. McClusky tells of an exhibit hall in the Metropolitan Museum of Art in New York that was "a sea of all types of visual materials." Here were school-produced motion pictures and pupil-made maps, bas relief as well as flat. Here were numerous student-constructed models, to say nothing of scrapbooks, charts, graphs, paintings, and other varieties of visual materials.

The possibilities for constructive activities in such materials, and the opportunities for correlation of such diverse subjects as art, English, history and shop work are obvious. The activity, however, must not become an end in itself. Ernest Horn has given three cautions which should be exercised to insure the greatest value from such work. Horn maintains that constructive activity should:

8 William James. *Talks to Teachers on Psychology.* New York, Henry Holt, 1901. Pp. 33-34.

1. Contribute to an understanding of some important concept or process in social life.

2. Be guided by, and be a stimulus to, critical thought.

3. Be authentic.[9]

How may other individual aids be used to provide for pupil activity, which critics of audio-visual work claim is usually lacking in their use? In the balance of this section on self activity we will indicate some of the methods although we will not attempt to cover all specific aids or all the methods of utilizing pupil activity for any one aid.

The stereograph and the microscope are the easiest aids to use as a basis for intensive individual study. This is, of course, the usual way in which they are used although it is possible, with special equipment, to project microscropic images onto a screen. Moreover, modern motion picture science has produced movies which, when viewed through special glasses, become three dimensional. These developments, particularly the movies, have not yet been used greatly in education, so the microscope and stereoscope are still the chief aids for intensive individual study activity, the latter having proved its value in many studies where three dimensional concepts are important.

The projected slide picture may be studied by the individual, but it is also adapted to group activity. We have already discussed the technique of holding a few pictures on the screen for a considerable period of time while the teacher and the class discuss and analyze the picture. This gives the class a common basis for discussion, and may be valuable as an interest stimulant in a preview of the unit. The same technique also may be used to present assimilative material during the intensive study of the topic, or as a rapid fire group review at the end of such study.

A large number of quickly presented slides tends to dull students into a passive "isn't it a pretty picture?" frame of mind. On the other hand, the analysis by the group of a few well-chosen pictures arouses a high degree of pupil activity. Even photographic slides are not difficult to make, and the principle of activity may be carried farther by having the pupils make and project their own slides.

Pupil activity and participation are, perhaps, more difficult to provide for in using educational motion pictures than in certain other visual aids. We even have heard navy men criticize showings of the usually well-prepared training films on the score that there was no preparation made for the film and no activities planned in connection with it. Criticism of this sort is too often justified, but it does not reflect on the value of the film itself. Rather, the problem is one of utilization.

Probably no film should be shown without class preparation and without a follow-up discussion. The teacher who knows the film can even conduct a rapid fire class discussion while a silent film is proceeding. In a sound film, if no activity has been written in, the sound track may be turned off on a second or third showing and pupils asked to explain the action. Sections of a picture may be run in reverse order on a second showing, and pupils asked to explain what has preceded

9 Ernest Horn. *Methods of Instruction in the Social Studies.* New York, Scribner's, 1937. P. 417.

the action. Some members of the class might write about the picture or report on corrolary readings, while others might make visual representations of attitudes or ideas gained from the picture in cartoons or home-made slides. There are many ways to get around student passivity if the producer has not provided activities in the film itself.

One interesting student activity in the motion picture area is the making of a school film based on some local theme which is relevant to school work or studies. Beverly Hills high school produces successful films on its varied activities, each film becoming part of the school record and serving a distinct purpose in school public relations. Similar individual activities can be worked out by the alert teacher who is using other audio-visual aids such as radio programs and recordings. The teacher will do an easier and better job, however, if activities are provided for in the material itself by the producer and described in teaching manuals. With these facts in mind we believe the following basic rules for teachers and producers may be drawn from the principle of self activity:

1. See that audio-visual materials are designed for pupil activity and not for mere passive reception.[10]

2. Use these audio-visual materials as a basis for purposeful, intelligent pupil activity.

Interest

The factor of interest has been stressed by many educators and psychologists, but few of greater stature than William James and John Dewey. The latter's *Interest and Effort in Education,* published in 1913, is a classic statement of the principle of interest. Misunderstanding of the ideas stated in this volume has led, in certain cases, to the teacher taking the role of chief performer in what might be termed a classroom vaudeville show. Despite the justified criticism which such abuses of a sound principle have aroused, there is no doubt that the most effective learning takes place when the learner is interested and wants to learn. We have all heard the adapted jingle:

You can lead a horse to water but
you cannot make it drink;
You can lead a child to learning
but you cannot make him think.

The teacher can expose the pupil to learning, but she cannot make him learn unless he is really interested and wishes to give his attention to learning.

William James made and clarified the principle of interest in his 1890 volume, *Principles of Psychology.*

"Millions of items of the outward order are present to my senses which never properly enter into my experience. Why? Because they have no *interest* for me. *My experience is what I agree to attend to.* Only those items which I notice shape my mind—without selective interest, experience is an utter chaos. Interest alone gives accent and emphasis, light and shade, background and foreground—intelligible perspective, in a word. It varies in every creature, but without it the consciousness of every creature would be a gray, chaotic indiscriminateness, impossible for us even to conceive."[11]

10 Bruce A. Finlay's *Audio-Visual Aids That Teach for Keeps* (Los Angeles City Schools' Publication 395, 1944) is a brief pamphlet with a wealth of suggestions on methods of providing for pupil activities.

11 William James. *Principles of Psychology*, vol. I. New York, Henry Holt & Co., 1890. Pp. 402-403.

Dewey specifically applies the principle of interest to school work as follows:

". . . little can be accomplished by setting up 'interest' as an end or a method by itself. Interest is obtained not by thinking about it and consciously aiming at it, *but by considering and aiming at the conditions* that lie back of it, and compel it. If we can discover a child's urgent needs and powers, and if we can supply an environment of materials, appliances, and resources—physical, social, and intellectual—to direct their adequate operation, we shall not have to think about interest. It will take care of itself. For mind will have met with what it takes to *be* mind. The problem of educators, teachers, parents, the state, is to provide the environment that induces educative or developing activities, and where these are found the one thing needful in education is secured."[12]

Are audio-visual aids important "materials, appliances, and resources" in the provision for interests? To anyone who has used audio-visual materials, or seen them being used, the answer is obvious. Children have great curiosity. They wonder and puzzle about apparatus and objects with which they are not familiar. They like to look at new pictures, slides, stereographs, charts and motion pictures. They are excited at the chance to make things, to play with models. They enjoy listening to records and the radio; they like to hear recordings of their own voices. For this reason audio-visual materials have been used widely and successfully as interest-arousing devices, and are among the most important materials in the modern school which attempts to provide for interest.

In fact, audio-visual materials are so effective in arousing interest that there may be an inherent danger of over-stimulating the class, of turning the lesson into a sort of desultory entertainment. This danger can only be avoided by making use of a few carefully selected pictures, records or radio programs and really using them to teach. By good use of audio-visual aids, a teacher not only can avoid exposing the pupils to a flood of new experiences which will confuse and scatter their attention, but she can, by careful concentration on the unit of work, use them to aid in the mastery of the unit. When good aids are used in this fashion, they will serve to clarify ideas, as well as stimulate attention and interest.

It has been our observation that good educational movies are particularly interesting and appealing to pupils. We would agree with William Hartley's statement:

"The movies appeal strongly to youngsters. From them they gain a realistic concept of the social scene as it is or was. Historical characters take on life as they move and talk on the screen. Despite the tendency of some students, and even some teachers, to make the film an end in itself, the amount of stimulus this aid has given to the pursuit of the social studies has made it one of the most valuable aids the teacher has available."[13]

Movies and other audio-visual aids

12 John Dewey. *Interest and Effort in Education.* Boston, Houghton Mifflin Company, 1913. Pp. 95-96.

13. W. H. Hartley. *Op. cit.*, p. 109.

may be used to arouse interest when a unit is being initiated. For example, a display of Indian costumes and weapons, pictures of Indian life, or a motion picture of Indian games and dances may be secured to introduce a unit on the American Indian. The aids also should be used throughout the study of the unit to maintain interest. Specific suggestion for use in various grades are given in Chapters XI-XIII of McKown and Roberts' *Audio-Visual Aids to Instruction.*[14]

If audio-visual materials are to develop and maintain pupil interest as they should, several specific suggestions are again in order.

1. Audio-visual aids should be arresting.

2. Aids which provide for manipulation should accompany non-manipulative types, if possible. We all like to handle things, and this manipulative tendency should be satisfied.

3. Audio-visual aids should be novel and provide a change from traditional class activities. We remember with horror one motion picture on United States territorial possessions which was little more than a series of dull maps of islands with only one or two shots of natives, animals and ships. One might as well have placed an oversize, rather poorly designed textbook at the front of the room.

4. In the use of visual materials, particularly, the class should be free from the formal restrictions of traditional recitation periods.

5. Audio-visual materials should satisfy some need which the child feels, provide some particular value which he wants, or help him in reaching for some definite goal.

6. Audio-visual aids should not satisfy the pupil completely, but should bring to his attention new ideas, new problems or complications, and new questions which will stimulate him to additional interest and activity.

If these suggestions are followed, audio-visual aids will be wisely designed and wisely used. They will provide for and develop real pupil interest.

Apperception

Apperception is a principle which was developed by Herbart and stressed by the Herbartians. Briefly, the idea is that children link new experiences with old, that what the child or the adult learns is interpreted in terms of past experience and present frame of mind. As Clarence E. Ragsdale puts it:

"A dynamic container theory of mind is given by Herbart and later by the Psychoanalysts. The contents of mind are themselves active and dynamic. Each idea is a living, active unit which attracts or repels other ideas. These attractions and repulsions lead to mental organizations, i.e. the formation of apperceptive masses and complexes."[15]

There is considerable evidence and justification for the view that effective learning can best be accomplished when the new is linked with the old. We see new impressions interpreted by past experience when we hear primitive people calling their first airplane a bird because they have experienced birds but have never experi-

14 Harry C. McKown and Alvin B. Roberts. *Audio-Visual Aids to Instruction.* New York, McGraw-Hill, 1940. Pp. 243-325.

15 C. E. Ragsdale. "Modern Psychological Theories Which Have Implications for Personality Development." *Education*, vol. 61 (June, 1941), pp. 582-591. P. 584.

enced machines moving through the air.

There is similar evidence and justification for the idea that learning is also influenced by the "mind set," and that our immediate response is determined by what we are thinking about when the stimulus occurs. Probably we have all had the experience of misreading a word or phrase because we were influenced by thoughts not connected with the idea being expressed in the material. Certainly most radio announcers can quote gruesome examples of this.

For a good class lesson, then, the children should have a certain common experience-background to which the teacher may refer. Moreover, the class should be in a proper frame of mind for the lesson. The careful use of pictures and other audio-visual materials should have a place in building this common background of class experience, and in creating a proper frame of mind for the lesson.

F. D. McClusky tells of a teacher's futile attempts to explain "leads" (the lanes of open water) in Arctic ice. The grade-school children could not understand or grasp the verbal explanation until one of them pointed out that in a brook near the school there was ice along the sides, open water in the middle. This concrete visual reference made the concept clear immediately. How much time and effort the teacher would have saved if she had started the lesson by having the children look at the brook or by having pictures of Arctic leads. And in how much better a frame of mind the pupils would have been to continue their lesson.

Audio-visual materials may be used to provide new experiences which the student will link with his past impressions and experiences. They will also prove of value in correcting former wrong impressions which the student may have gathered along the way.

Probably most students have never experienced, and never actually will experience, the South Sea Islands or the Arctic regions. A great many have not seen high mountains or great oceans, and may never see them. Most of them have never visited Washington; they have no idea of Congress in action.

Through such audio-visual aids as moving and still pictures, radio programs and transcriptions, however, we may give these children reasonably correct concepts of those things which they have not experienced. In any case, if good audio-visual materials are properly used, the children will have some vicarious experience on which to base more accurate concepts. They will have their interest aroused in the topic and will be in the proper frame of mind to continue the lesson.

What specific suggestions has the principle of apperception to offer to the producer and user of audio-visual aids? There are at least four which we may draw:

1. See that the student has the chance to make a connection between the new experience or concept to which he is being introduced and some experience which he has already had.

2. Be careful, in pictures especially, to avoid giving wrong conceptions of size, etc. Objects should be shown in understandable comparisons with other objects. Aids which give inaccurate or erroneous impressions are inexcusable.

3. Use audio-visual materials to

provide a common background of experience for group discussion and activity.

4. Try to see that all students are placed in a proper frame of mind for study. Audio-visual aids lose their effectiveness when failure to relate them to the work at hand turns them into mere devices for entertainment.

Gestalt

The gestalt principle of learning by patterns has been based on experiments in concrete sensory materials. It received its first clear expression in Germany with the work of Wertheimer on "seen movement." After his work in 1912 the movement was introduced to America, largely by the efforts of Wolfgang Kohler and Kurt Koffka. The former's *Gestalt Psychology* (New York, 1929) is a denial of the concept that actions can be isolated into elements such as reflexes, and that mental states can be thought of as elements such as sensations, images and feelings.

As Clarence Ragsdale states in his *Modern Psychologies and Education*:

"The Gestalt psychologists emphasize the unity of the human organism. They have chosen as their point of departure the principle that activities do not occur in isolation, but belong together with other activities in complete wholes."[16]

Another good statement of this view that the members of a structure are what they are by virtue of their place in the whole, and a criticism of the mechanistic interpretation of life in terms of stimulus and response is to be found in Robert M. Ogden's article, "The Need for Some New Conceptions in Educational Theory and Practice."[17]

In "learning," the gestalt psychologist criticizes any attempt to break up the continuity of learning into separate acts, or to think of learnings as different parts associated together. His theory is that the human mind grasps all its learning situations in pattern form and then analyzes out of the pattern by going back for further study, the elements being rearranged each time in reference to the new element being studied.

Charles R. Spain goes rather completely into the implications for learning in the gestalt theories. We quote briefly from his longer article:[18]

"The most common implications of this psychological system have been proposed as teaching of 'large wholes,' emphasis on the 'total situation,' emphasis on intrinsic motivation, and a minimum of purposeless drill and repetition.

". . . It seems plausible that the richer the 'field,' the more possibilities there are for differentiation of significant figure-ground relationships in this 'field.' Hence, there may be an enlargement of art experiences, more emphasis on manual activities, and the collection of greater amounts of instructional materials.

". . . Curricular experiences should be so designed that the child may be aided in attaining coherence, pattern, and integration in his day-to-day relationships. Without some kind of carefully thought-out design, the teach-

16 Clarence Ragsdale. *Modern Psychologies and Education.* New York, Macmillan, 1932. P. 85.

17 In *School and Society*, XVIII (Sept., '23), 343-8.

18 C. R. Spain. "Gestalt Psychology and the Curriculum Worker." *Curriculum Journal*, XII (Nov., 1941), 305-309. *Passim.*

er and curriculum worker are failing to render the child much-needed assistance in his attempt to develop meaning and coherence in his world. ". . . In classroom practice this principle has been thought to signify a need for larger units of work than have heretofore usually been attempted. Instead of page-by-page teaching of American history, we observe a unit on the American Revolution; instead of the very mechanistic approach to the teaching of grammar in the form of memorizing parts of speech and so on, we witness instructional units on how to write a good sentence; and instead of a detailed memorization of the mountains and rivers of South America, there are larger units of work on Brazil, Argentina, etc. There is very little doubt that this approach to larger 'wholes' is entirely to be desired over the previously more atomistic consideration of various subjects."

Translating gestalt principles into terms of audio-visual work would seem to indicate that audio-visual materials must go along with other work done and other materials used by the child. The presentation of audio-visual subject matter must be in terms of Mr. Spain's unified pattern: they must be specifically designed to aid the child in attaining coherence, pattern, and integration.

In closing, we list these four specific suggestions which are rather obvious, but too often ignored.

1. Audio-visual aids should be designed and used to enrich the work of the student in dealing with a unit of study.

2. The producer of audio-visual aids must have a clear, up-to-date, and very complete knowledge of what is being taught in the schools, in what units and by what materials. He must then design his aid to fit in with and supplement these materials and patterns.

3. The teacher must use audio-visual materials as part of her regular teaching, and not as something different or apart from this teaching.

4. Audio-visual aids lose teaching effectiveness when presented bit by bit, unrelated to other work which is being done.

Simultaneous Learning

Simultaneous learning is the last major educational concept which audio-visual users and producers should take into consideration. The basic principle was enunciated by W. H. Kilpatrick, another of America's true educational leaders. We will take the liberty of adapting and summarizing his statements[19] in defining and explaining the idea of simultaneous learnings.

The old educational view, Kilpatrick states, fixed attention upon one primary outcome, the knowledge or skill immediately sought. The assumption was that only one thing could be learned at a time, and that the school's business was to fix a list of things in desirable order and see that they were learned. Children were promoted and teachers judged by class success in learning a prescribed quota.

Kilpatrick believes contrariwise that learning is not confined to just one thing. In learning the multiplication table, for instance, the child learns to dawdle or not to dawdle; he acquires

19 Expressed in his article: "Dangers and Difficulties of the Project Method and How to Overcome Them." *Teacher College Record*, XXII (Sept., 1921), pp. 283-321.

a liking or disliking of arithmetic, teacher, and school; he comes out with self-respect, or its lack, and a just or unjust estimate of his powers. Moreover, he learns that it does or does not pay to try, that books and schools have something or nothing to do with life as he knows it, that he can or cannot put it over on teacher. He develops the belief that teachers, principals and the whole tribe of law-givers and enforcers are, or are not, engaged in a tyrannical effort to suppress real living.

The sum of such concomitant, incidental or by-product learning, as we can easily see, may and often does vastly overshadow the specific school learnings at which we are directing our teaching. Learning is a complex matter; and many more things are learned in school, especially when lifelike elements or situations are introduced, than we may be inclined to imagine.

To quote Kilpatrick directly:

"Learning does not, as a rule, best go on with logically simple elements. Being logical elements they are likely to be devoid of the connectedness that on the one hand call forth interest and endeavor, on the other make for those further connections that constitute true learning. More lifelike elements are demonstrably superior. . . . A second difficulty facing the older learning analysis is that learning is never single. Many learnings of necessity go on simultaneously. No child assigned to a task learns, well or ill, just that one task."[20]

Thus, when the student engages in any learning, he acquires, along with the lesson at hand, additional learnings, ideas, and attitudes. The teacher should be aware of this fact. She should do more than piously hope that her charges are developing an appreciation of the subject being studied, that they are learning how to do neat work, to be intellectually honest, etc.

Character education should go hand in hand with other learnings. The good football coach, for example, should teach not only the fundamentals of the game, but also qualities of good sportsmanship, cooperation in team play, loyalty to school and leader, ability to think and act quickly and to give and take physical punishment. These are simultaneous or concomitant learnings.

In many cases audio-visual aids may be used to tie together these simultaneous learnings which go on in every class. They may be used to point up or emphasize one or more of the learnings which are the goals of the teacher. Neatly prepared papers, for instance, may be displayed as an example for the rest of the class. Honesty and courage of conviction may be specifically noted in motion pictures dealing with historical characters, and these qualities should be given credit when displayed by individuals in the class. Motion pictures, radio programs, recordings, and many other audio-visual aids may demonstrate character values, bringing many desirable simultaneous learnings.

In conclusion, there are two general suggestions which may be drawn up to provide for concomitant or simultaneous learnings. They are extremely important but intangible and variable,

20 W. Kilpatrick. "Method and the Curriculum." *Journal of Educational Method*, I (April, 1922), p. 213.

dependant on the individual class and individual teacher. They are, in our opinion, good general rules on which to end.

1. The producer of audio-visual aids should become more aware of simultaneous learnings, as he should of all the other principles which we have discussed. He will then design and produce materials which have more positive values for the learner.

2. The teacher should remember what she has studied about simultaneous learnings and other psychological principles in her college or university work, and she should apply these principles in more positive teaching with audio-visual materials.

BOOK REVIEW

The Preparation and Use of Visual Aids. By Kenneth B. Haas and Harry Q. Packer. Prentice-Hall, Inc., New York, 1946. Pp. xii + 224. $4.00.

Audio-visual education is not only making an impact upon formal education but it also is being employed in industry, particularly in sales, distributive education, advertising, and personnel training. Training and education departments in industry are concerned with concrete, direct types of teaching, the results of which can be objectively measured by the performance of the employee as a skilled, efficient worker. Hence, the use of audio-visual materials and techniques is appealing to teachers in industry who desire to employ time-saving methods and procedures. *The Preparation and Use of Visual Aids* is designed with the objective of showing how to achieve through audio-visual techniques greater effectiveness in personnel training, in setting up sales demonstrations and displays, in educational programs, and in advertising campaigns.

The book is divided into 13 chapters, each one of which is devoted to a type of visual aid. For example, the chapters and their titles are:

Chapter

1. Motion Pictures
2. Discussional Stripfilm and Sound Slidefilm
3. Training Slides
4. Opaque Projector
5. Maps, Charts, Graphs, and Diagrams
6. Flash Cards
7. Posters and Manuals
8. Pictures and Photographs
9. The Blackboard and Bulletin Board
10. Objects, Specimens, and Models
11. Training Laboratory
12. Field Trips
13. Television

Many of the subdivisions of each chapter are typified by statements beginning with the words *how to*. For example, "How to Operate Motion Picture Projectors," "How to Use Slides," "How to Test the Trainee," "How to Use Flash Cards," etc. At the end of each chapter is a list of *do's*. For example, "Do's for using the bulletin board," and "Do's for the use of television."

The book contains many practical suggestions for making training materials and the steps are outlined clearly in numbered sequence. Many of the suggestions are so elementary that the reader may wonder about the intelligence of the audience to which the book is addressed. The authors, Kenneth B. Haas and Harry Q. Packer, have had extensive experience in education, business, and industry, however, and the book reflects their belief based on experience that simple, clear-cut directions are essential for effective use.

The Preparation and Use of Visual Aids is illustrated with appropriate sketches and half-tones, many of the cartoon type, and contains an extensive list of sources of materials and equipment. It will be useful as a handbook or supplementary text for those who are in charge of training teachers in industrial subjects. — F. D. McCLUSKY

Industrial Teacher Training *and* Audio-Visual Education

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THE inherent nature of industrial education is harmoniously integrated with audio-visual education. The skills of the various trade fields are inevitably taught from the fundamentals upon which audio-visual education rests. Students in industrial classes seldom catch the school disease of *verbalism* in the shop.[1]

It is not uncommon for the student to spend his first day in the school shop working with real machines, real tools and real materials, and to show progress in the construction of a useful article. Student participation is preceded by teacher demonstration. It is almost as if there were no other way. Suppose that a machine shop student wishes to make a hand punch. To do this he must learn to center drill. This skill cannot be acquired from the textbook or class discussion. It is logical therefore that the instruction take place at a machine, usually a lathe or drill press. For the shop instructor, the demonstration-application procedure is doing what comes naturally.

The starting point in industrial teaching is, therefore, closely associated with the optimum conditions for visual sensory experiences. The motivating forces of industrial teaching are stored up, somewhat like potential energy, in the machines, tools and materials of the school shop. When such forces are released by the instructor they kindle the fires of interest and enthusiasm and sweep the student into the stream of productive achievement.

The industrial instructor does not, like many instructors, make a start from zero in teaching aids. He starts with the most important of all instructional devices—the real thing. The next steps are relatively simple. The industrial teacher draws upon his broad experience as a craftsman to isolate those skills or operations related to the job that make the difference between success and mediocrity in shop work. He sometimes calls these items the *key points* of the job. Without a thorough understanding of these *musts* the learner can achieve only a minimum of understanding, appreciation and skill. It is in this area that supplementary audio-visual devices become important factors in learning.

In a recent study of audio-visual aids in the armed services, Miles and Spain suggested the following implications for vocational and social competence:[2]

1 Edgar Dale, *Audio-Visual Methods in Teaching*, (New York, The Dryden Press, 1946), p. 16.

2 John R. Miles and Charles R. Spain, *Audio-Visual Aids in the Armed Services*, (American Council on Education, Commission on Implications of Armed Services Educational Programs, Washington, D. C., 1947), pp. 77-93.

1. "Multi-sensory instructional materials should be used extensively at all levels of education.

2. "Effective use of newer types of instructional materials should be based on systematic and careful studies by educational groups of the functions of such materials in teaching and learning.

3. "Multi-sensory instructional materials should be conceived as aids rather than as self-contained teaching devices.

4. "Improvement of instruction through the use of a variety of instructional materials can be effected by local ingenuity and initiative.

5. "Multi-sensory instructional materials should be employed in general education as well as technical and vocational training.

6. "Multi-sensory materials afford an effective means for extension of vicarious learning.

7. "Effective utilization of audio-visual materials necessitates both pre-service and in-service education in the use of such aids.

8. "Multi-sensory instructional materials afford a means of capitalizing upon individual differences.

9 "Local, regional and national surveys are needed periodically to determine current uses of available teaching aids, needs for new aids, and methods of facilitating production and distribution of these aids.

10. "Distribution of films should be decentralized to assure more adequate utilization.

11. "The variety of types and uses of military training aids and evidence of their effectiveness suggest the need for civilian educators to explore the uses of such materials for both new and old educational purposes."

The vocational industrial instructor whose teaching experience extended through national defense and war production training became accustomed to a wealth of industrial films. He used these in the training of the industrial army, and he became aware of the claims of shortened instructional time and the approach to permanent learning. Furthermore, he began to think of visual aids and motion pictures as synonymous terms. However, "in the main, most shop teachers are restricted to working with other types of visual aids, namely those which can be constructed within the shop."[3] Such common types of visual aids are extremely effective and meet the requirement of added emphasis at the difficult levels of shop teaching.

With these favorable conditions existing in industrial teaching, what audio-visual problems arise in the training of industrial teachers?

First, industrial teachers, like many other instructors, have not had specific instruction in using audio-visual devices. This results in a lack of appreciation of the field and the values to be obtained. Second, very little information has filtered down to the shop instructor on methods of constructing the simple visual devices. Third, the necessary equipment for using visual devices is either not available or is available under inadequate conditions. In some cases the availability of the equipment is unknown. A fourth obstacle commonly noted is that the instructor does not have complete knowl-

3 Gilbert G. Weaver, "Practical Hints on the Use of Common Types of Visual Aids in School Shop Instruction," *Vocational Instructors School Shop Handbook*, Visual Aids Issues, No. 2, Fall, 1945, p. 495.

edge of how to obtain information for his specific field of teaching. Training in audio-visual education for industrial teachers is, then, concerned with an attempted solution of the four problems mentioned above.

The instructor begins his study in audio-visual education by first determining what machines are available for his use in his local school district. He determines also the frequency with which the machines are available for his use. Is it possible for the instructor to have the motion picture projector once a day, week, month? How much time can he expect to use the slide film projector, the slide projector, the opaque projector? Such a survey forms a frame work upon which the instructor may plan his audio-visual projects.

Although the instructor is expected to study audio-visual devices beyond the availability in his particular case, he starts his study in terms of those devices within his reach. The instructor is reminded constantly that good instruction is usually the result of good planning, and that learning may be improved by an audio-visual approach. However, even with the best equipment available and an abundant supply of films, charts, or slides a poor plan of instruction does not automatically become better. The industrial instructor must determine, usually by a job or operation analysis, what items of instruction should be visualized. He locates those items that are hard to learn or hard to teach. He must find the areas where the student fumbles, progresses slowly, or even fails to absorb the instruction. Once the obstacle is determined, a plan can be devised to supplement the instruction over and beyond that required for less difficult material, since even the simplest of visual means may be a key to an understanding of a difficult situation.

In training the instructor receives actual work experience in preparing visual aids. Such aids as blackboard drawings and blackboard stencils, when thoroughly understood, become extremely useful as teaching aids. The many varieties of hand-made slides may open an avenue of instruction previously unknown to the instructor. As the instructor develops skill and understanding by laboratory experience in the preparation of slides, he also develops a sense of values. He finds that certain types of slides have more importance under one set of conditions than under other conditions. The value of some degree of skill in the preparation of slides becomes apparent when the instructor finds that a poorly prepared slide does not improve upon being magnified twenty or thirty times.

The preparation of hand-made charts to picture a shop problem or principle and charts to illustrate shop safety have been found to be most useful. A small drawing is enlarged to the proper size by the use of a balopticon, and traced on bristol board. The drawing is then completed using show card paint. It is not uncommon for an instructor to want to prepare a series of safety posters to use throughout the school year in his continuous campaign toward shop safety. Again a certain degree of skill is helpful. Even though an instructor may assert that he is not an artist, experience shows that he has more talent than he thought.

The training of the instructor is not complete without some experience in making drawings on stencils or the

master sheets of the various duplicating processes. Instruction sheets are measurably improved when appropriate diagrams are included. There are many experienced instructors in teacher training who have never prepared a stencil or master copy for duplication. The lack of interest shown in this phase of the audio-visual teacher training is almost unbelievable.

Instruction in the use of the various machines, threading of the motion picture projector for example, is carried on simultaneously with the laboratory work. Specially prepared job sheets are available for instructors having no previous experience in the use of motion picture projectors.

A very important phase of teacher training is concerned with the availability of all types of visual aids. Many charts, diagrams, motion pictures, models, maps and other devices are available from commercial concerns. Locating such materials is a part of the instructor's training. Large equipment and tool manufacturers have separate educational departments whose major function is to prepare and supply information of this nature. Although criticism has frequently been directed toward this practice because of the advertising found on the materials, many of the manufacturers include only a small amount of information to identify the origin of the material.

One of the important phases of audio-visual instruction for industrial teachers is concerned with the use of the audio-visual devices in practice teaching. Instructors prepare teaching plans involving one or more of the audio-visual aids and actually teach the lesson to the rest of the group. Criticism and analysis of the lesson are effective reminders of the strong and weak points of the teaching process. When the practice demonstration can be recorded, the instructor may have a further check on the quality of his voice and method of delivery. The practice of having the recorded lesson played back through an oscilloscope presents a visual picture of the shape of the voice waves and gives a visual record of the quality of the voice.

The writer recently conducted a course in audio-visual education designed especially for instructors of trade and industrial subjects. During the first days of instruction it was noted that two of the student instructors showed very little interest in the suggested program of work. However, as the course progressed, the same two teachers became completely absorbed in the work of the visual aids laboratory. The writer's curiosity led him to propose a written assignment which might reveal the sudden transformation. The following is quoted directly from these papers:

"There are many things in my shop that were prepared by other instructors. Although I admired their work, I was reluctant to continue it for fear of not being able to measure up to their standards. The fact that I made my own charts (the first ones I ever made) and cut my own stencils makes me feel that I have a better control of the situation than ever before."

"As a result of my experience in making a blackboard stencil, glass slides, mimeograph and hectograph sheets I will now be able to portray realistically, in a matter of minutes, content that has been more or less abstract and which has taken too long a time in explaining. It is hard to get

the motion picture projector in my school and most of the time it doesn't work. I have learned that I can use other aids that will add color to jobs that seem menial and routine."

Certainly laboratory experience in constructing and using the various common visual aids should be a part of successful industrial teacher training.

In the final analysis it is essential to examine critically the choice of each visual device. Hit or miss methods of selection seldom result in the best usage of audio-visual aids. When the instructor can successfully defend his selection in terms of need and expected outcomes, however, the device selected may be given the final test of actual use in the class room.

In a few instances industrial instructors have been known to become so absorbed and enthusiastic about audio-visual aids in instruction that they have lost sight of other important phases of the teaching job. This, however, is rare in occurrence.

As mentioned earlier, the shop instructor is in a fortunate position in that the very nature of his work is predominately demonstration. Extending the demonstration by further use of other audio-visual devices can result in improved quality of instruction. Such is the goal of industrial teacher training.

Although audio-visual laboratory work in industrial teacher training is not new, few of the training agencies have developed extensive programs. Leadership in promoting increased emphasis in this area has come from the vocational division of the United States Office of Education. As a result of this interest, other states have had an opportunity to examine critically certain outstanding programs and have then inaugurated their own courses of study in audio-visual education.

The laboratory work to be described considers, in the following order, the blackboard, slides, charts, graphs, maps, diagrams, duplicated instructional materials, slide films and motion pictures. This arrangement is based on the assumption that where the industrial instructor has acquired a limited knowledge of audio-visual aids, this knowledge is most frequently concerned with slide films and motion pictures. Quite probably this is due to the wide publicity given to these types of audio-visual aids.

In the first unit dealing with the blackboard, the course syllabus contains a brief resumé of this aid and then presents a job sheet on *How to Make A Blackboard Stencil.*

Trade instructors frequently find it necessary to prepare large, complicated drawings of machine parts or of processes concerning some phase of their trade. Such drawings require a considerable amount of time to prepare, and in some cases the vocational industrial instructor is unable to use any other visual aid.

If a stencil is prepared for the particular drawing, the time of reproducing the drawing is materially reduced. The stencil may be saved and used from time to time as occasion demands. The blackboard drawings are usually completed with colored chalk which emphasize the essential features of the drawing and aids the learning process.

When the stencil is finished the drawing is completed on the blackboard and evaluated as a teaching aid by the instructor and other members

of the class. This is usually demonstrated by asking the industrial instructor to teach a lesson to the class involving his blackboard drawing.

The unit on slides contains a resumé of this aid, points out some of the brief characteristics and lists the most common types of slides. The job sheet *How to Make a Typewritten Slide* contains the following information:

"The typewritten slide is sometimes known as a typewritten cellophane slide since cellophane is used as the carrier for the typewritten words. Either white or amber colored cellophane may be used, and either black or red carbon paper.

"The typewriter type should be clean in order to obtain the clearest impression possible. Best results are usually obtained by setting the typewriter to the stencil position. A little practice is usually required, since an even touch is a necessity. Small errors are greatly magnified through projection.

"It is a good plan to type the required information on a sheet of plain paper. In this way the spacing may be worked out before the actual cellophane sheet is typed. Remember that approximately $\frac{3}{8}''$ must be allowed on all sides of the slide for binding.

"Do not crowd the work on the slide. Attempt to limit the number of words to sixty or eighty. Badly proportioned work may defeat the purpose of the slide."

The etched glass slide, because of its ease of preparation, offers a wide range for development of visual materials for the trade instructor.

The slides may be prepared for temporary use, cleaned and then reused. Figures and drawings to be saved for re-use may be bound in the regular manner and kept as permanent slides.

Etched glass slides are properly used when tracing a drawing or picture. Original drawings should not be made directly on the ground glass due to the difficulty of making changes or erasures.

When an industrial instructor shows particular interest in slides and the necessary projection equipment is available in his shop, he is given the opportunity to prepare other types of slides. Frequently an instructor will make a dozen or more slides in the laboratory to use in several units of work.

In a similar manner job sheets have been prepared on *How to Make a Chart* and *How to Cut A Mimeograph Stencil.* It is important to note again that this is primarily a laboratory course and the students have an opportunity for actual work experience. Because of this experience, interest is developed and many instructors have prepared a number of stencil drawings covering critical phases of their courses of study.

At this point in the laboratory work the industrial teacher trainer observes an apparent instructional problem. It borders on insult to suggest that a vocational printer prepare instructional material involving the typewriter or any of the duplicating processes. The obvious adjustments in the course of study are made and the printer seizes his opportunity to demonstrate the superiority of his trade. Successful experiments have been completed involving printing directly on glass slides and on cellophane. Various colors and styles of type have been used with remarkable results. One printer prepared a series of slides to

tell *The Story of Color.* His clever use of colored inks and colored cellophane in the slide series introduces clearly, concisely, and with pointed interest the subject of color in printing. Furthermore, the instructor has been stimulated to investigate further this new field of interest.

Assignments for the areas of slide films and motion pictures have dealt chiefly with locating all of the available films for a particular trade. A complete library of catalogs and reference books is available for the instructor to use. He records all of the pertinent data for each film. In most instances this is the first experience the instructor has had in attempting to determine just what is available in his particular trade. When the films can be obtained locally the instructor makes an analysis of the film to determine its suitability as an instructional aid for his course of study.

The most satisfying reward for the industrial teacher trainer is to observe the various paths of interest created in the teacher. The worth of audio-visual education is measured in terms of what the instructor does outside of the class. An industrial electricity instructor prepared an excellent set of charts to visualize the generation of a sine wave. Later he replaced his black and white charts with colored charts. Motion appeared to be a factor so he added a coil of wire which could be revolved to add reality to the chart. This led to the preparation of a model. He retained the coil of wire but added batteries and lights. As the coil of wire is revolved through the magnetic field the lights trace out the generation of the wave. It doesn't take long for his students to grasp the concept involved. He has spent untold hours preparing this visual aid, and all the work merely supplements work with the real thing. The instructor now plans to prepare a model to demonstrate three phase systems.

A cosmetology instructor found that her set of slides visualizing the preparation of a certain type of hair style was not adequate. Some of the steps had been left out. Continuity of action was important for group instruction. The instructor decided to make a short film. With the help of her colleagues in cosmetology she prepared a script. The photography instructor supplied technical advice and assistance in arranging the lighting. A model and operator were selected and after the appropriate rehearsals the film was made. Now with a 100 foot color film, almost totally free of the amateurish tinge, the instructor has developed an adequate aid for group instruction. A difficult but important instructional problem has been solved.

An extremely valuable function of the laboratory work lies in the fact that the laboratory literally never closes. Industrial teachers may visit the laboratory at any time to work out projects involving preparation of audio-visual aids. A telephone call is received from an instructor who wishes to work on Friday afternoon and Saturday on a project in audio-visual instruction. Another instructor writes in from 300 miles away telling of his plans to spend a week in the laboratory on a project of particular interest to him. Still another instructor plans to shoot several reels of film to illustrate a sequence of operations on the lathe and shaper. To be sure, most instructors do not return to the laboratory to work. It is evidently easier for them to arrange for the ma-

terials of their choice and prepare visual devices in their own shop. However, those who do return, do so of their own free will; no credit is involved except their self-satisfaction in doing a better job of teaching.

One of the final laboratory projects consists in attempting to select visual devices of specific teaching assignments. An instructor may select from his trade analysis or course of study those jobs or topics which in his opinion will need special treatment. It is understood that in many instances more than one visual aid may be required. In short, to paraphrase Herbert Spencer, this is an attempt to determine *What Visual Aid is Most Worth*. This procedure can be evaluated, at the present time, only subjectively. The writer believes, however, that the procedure has value. When four or five machinists sit down together to make a first choice in the selection of a visual aid for a particular job, differences of opinion are frequently noted. Eventually these differences of opinion are reconciled and agreement is reached. One may be assured that by this time all of the elements of the teaching job have been brought to light. Learning has undoubtedly taken place; new concepts and new understandings have entered the teaching job.

In spite of the multitude of teaching aids available the instructor must select his teaching aid with caution. Availability is not necessarily synonymous with the right choice. It has never been good practice to apologize to a class for the inadequacy of the instructor's selection of teaching material. It is difficult to forecast the future of audio-visual education in industrial teacher training, but the prospects look good.

BOOK REVIEW

Audio-Visual Methods in Teaching. By Edgar Dale. The Dryden Press, Inc., New York, 1946. Pp. *xviii*+546. $4.25.

Interest in audio-visual methodology is spreading rapidly through the teaching profession. An increasing number of teachers in training and in service are desirous of learning about teaching aids and their utilization. The number of courses being given in normal schools and universities has doubled in the past ten years. All of which adds up to the fact that the appearance of an authoritative textbook is timely.

Audio-Visual Methods in Teaching meets this need for it is a volume planned to serve both as a textbook and as a guide for teachers in service. In writing the book the author organized it into three sections:

"I. The *why* of audio-visual materials—five chapters dealing with the theory underlying the use of audio-visual materials in education, (pp. 1-62).

"II. The *what* of audio-visual materials—twelve chapters, each of which describes and discusses the various types of materials, (pp. 68-309).

"III. The *how* of audio-visual materials—seven chapters that discuss classroom applications in different subject-matter fields, and five chapters on administration, evaluation, and preparation of materials, (pp. 316-529)."

Each part may be read separately and the chapters are numbered beginning with 1, 2, 3, and so on under each section. So it might be said that Dale has published three books in one. This organization increases the book's flexibility as a text and as a study guide in an in-service training program.

This book is based on the author's long experience in the field as a research worker and as a teacher of teachers seeking enlightenment about audio-visual methods at Ohio State university. As a result, the reader senses that the ideas presented have been tested and tried in practical situations. — F. D. McCLUSKY

Suggestions *for a* Course *in* Audio-Visual Education

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Topic One. The place of audio-visual instructional materials in the learning process and in the curriculum.

A. The nature of the learning process

1. Learning takes place when an individual becomes aware of something new in his environment. The process involves a perception of one or more new factors and a rearranging of ideas or behavior patterns in order that these new factors may be taken into consideration in the thinking and the behavior of the individual.

2. All learning arises out of experience that an individual has.

3. The quality of the learning that takes place is dependent upon:

a. the ability of the individual

b. the nature of the previous experiences that an individual has had

c. the quality of an individual's present experience in terms of

(1) their relation to the other experiences of the individual

(2) the extent of their reality for the individual

4. All abstract thinking or generalizing must be based upon concrete experience that an individual has had.

B. Importance of the use of audio-visual aids in the learning process.

1. Definition of audio-visual aids —the planned use of objective materials for the purpose of providing the utmost reality in learning experiences.

2. The whole principle underlying the use of audio-visual materials is found in the self-evident fact that individuals gain more understanding from realistic experiences than they do from experiences that lack realism or clarity. In general it is possible to distinguish several planes of experience in learning situations:

a. Contact with the real situation. This involves seeing, hearing, feeling, smelling, tasting the elements of the experience. Exepriences of this type are most apt to give an individual a correct impression and understanding of the situation to which they pertain, especially when they are combined with the doing of things that are an essential part of the situation.

b. Contact with a faithful representation of the real situation. If this representation is complete and accurate enough, it may provide learning experiences which are as valuable as a means of forming understandings as the actual situation itself. This can be true because of the *reality* of the representation. Included in such types of representations might be such audio-visual aids as models, motion pictures, still pictures, television, dramatizations.

c. Contact with symbols which

represent the real situation. Examples of such symbols are speech, mathematical symbols, charts, maps, and graphs. The value of these symbols as means of providing experience is great, but *only when the learner has a clear idea of what the symbols represent.* It is not the purpose of audio-visual education to eliminate the use of symbols in giving instruction but to reduce as far as possible the use of symbols in situations where the learner has no adequate idea of their meanings.

3. Most audio-visual aids can be classified in groups *a* and *b* because they involve experiences with real situations or with realistic representations of real situations. Because of this they do not call for an understanding of *language symbols* as a prerequisite for understanding the experience of which they are a part. Some few visual aids, such as maps, graphs, and charts, are symbols but have great value because they are more readily understood than verbal symbols and make possible the giving of information that would be understood less clearly if it were to be verbalized entirely.

4. Some specific educational values to be gained from the correct use of audio-visual instructional aids:

a. They provide a means for the teaching of new materials which cannot be adequately taught by means of word symbols alone because the learners lack a basis for understanding the word *symbols* which must be used to represent these new materials.

b. Because they make it possible for learners to gain clear understandings in spite of vocabulary differences or deficiencies they provide a more effective means of instructing learners of varying mental abilities, experience backgrounds and degrees of maturity.

c. By including a variety of sensory stimulations, many types of audio-visual materials make a more lasting impression on the mind of the learner.

d. They provide variety in teaching methods and thus appeal to learners who find continuous reading and talking fatiguing.

e. They are especially rich in opportunities for the learner to participate actively in the elements of the learning situation.

f. They provide a means of saving time in instruction by enabling a relatively speedy presentation of some types of materials which would otherwise require long verbal explanations.

g. Some audio-visual materials, particularly motion pictures and radio dramatizations, can be used as powerful means of affecting emotional responses and, in this manner, influencing behavior responses.

C. Some implications for the use of audio-visual materials in the curriculum.

The curriculum is defined today as the total planned experiences in which a school child engages as a means of learning to make the fullest use of socially desirable abilities. Audio-visual materials are merely means of making the experiences of an individual most realistic and, therefore, most understandable to the individual. A number of important considerations must enter in planning for their use:

1. Audio-visual materials are not teaching methods but are *aids* that an instructor must choose and use intelligently if they are to serve their purposes.

2. When used, audio-visual aids do not constitute the entire learning situation.

3. The importance of audio-visual materials is such that suggestions for their integrated use should form a part of every well planned curriculum.

4. The nature of these materials is such that it is necessary to provide administrative and clerical assistance required to enable a teacher to secure the aids needed, when they are needed, and for as long as needed.

5. The values to be found in the use of these materials are of such importance that the expense of securing suitable aids should be a planned part of the school budget.

6. Specific training in the effective use of audio-visual materials should be given every teacher as a part of the in-service education program of the school system.

Topic Two. The Field Trip.

Definition—An organized and planned personal visit for the purpose of gaining first hand information.

A. The importance of the field trip as an audio-visual aid:

1. They make possible great realism through visits to actual places and by providing opportunities for the observation of all the elements in a learning situation.

2. They offer concrete evidences that may be needed to clarify instruction.

3. They bring the child into contact with the community and its problems.

4. They provide source materials for study.

5. They provide opportunities for self-expression and for socializing experiences.

6. They call for group and individual solution of a variety of problems arising from the need to plan for trips.

7. They appeal to more than one sense.

8. They provide integrated learning experiences.

9. They stimulate interest in the topic by the reality they make possible and by the variety they introduce into the school experience.

10. They are usually readily available and may be undertaken without much expense.

11. They serve to acquaint people of the town with the activities of the school.

12. They lead to further learnings which arise out of the trips.

13. They stimulate teacher interest in the work by the variety they bring into teaching.

B. Some possible limitations of the field trip.

1. The possibility of discipline problems: This can be reduced by careful advance planning and by developing the idea of self-direction as an important outcome of all field trip experiences.

2. Difficulties in planning: Remember to bring the learners in on this. Planning involves learning too.

3. They place much responsibility on the teacher: In California a teacher is responsible only for injuries to pupils under his control when he has been negligent. In spite of this limitation, taking a class out of the school must be done with careful consideration for their welfare.

4. Field materials may not be available when they are needed for study.

5. Field conditions are frequently not conducive to learning because of noise, inability of entire group to see and hear, crowded conditions, poor explanations given by field personnel, and the fact that important processes may be hidden.

6. The school schedule is not arranged to make field trips easy to plan.

7. Suitable transportation may be lacking or may be expensive.

8. Weather conditions may be unsuitable or uncertain.

C. Planning the school trip

1. Determine what topics in the curriculum can be made more vivid and interesting by bringing the learners into actual contact with objects and scenes being studied. The learners themselves can take an active part in this work.

2. Survey community resources to determine what materials exist that might be studied through field trips. Again the pupils can help. In some school systems teachers are limited to approved places which are listed for their guidance by the audio-visual center or the superintendent's office.

3. With the group of learners work out all details of the trip.

a. Develop the need and the educational objectives to be sought.

b. Clear all needed permissions which may have to be secured from school authorities, officials at the place to be visited, and parents.

c. Arrange for transportation, if needed, and list all items that members of group should take or wear on the trip.

d. Plan things to be seen and done and set stops to be made.

e. Determine methods of reaching educational objectives through:

(1) outlines

(2) lists of prepared questions

(3) student summaries to be prepared on trip as observations are made

(4) guide explanations to be requested.

4. Follow up the field trip with a variety of learning experiences.

a. What was found out about the problems for which answers were sought?

b. What pupil activities might arise out of the trip:

(1) reports on things observed?

(2) class evaluation of what was learned?

(3) creative writing and talking?

(4) determination of new interests arising out of trip?

Topic Three. Objects, Specimens, and Models.

Definitions: The object is the thing itself. A specimen may be an entire object, but more frequently it is just a representative or distinguishing part of it. A model is a replica of an object or thing, usually, but not necessarily, in miniature.

A. Some educational values to be found in the use of objects, specimens, and models.

1. They enable the instructor to give a realistic presentation of information.

2. Their use adds interest to lesson materials for the learners.

3. The assembling of objects, specimens, and models affords good opportunities for learner activity both in collecting and in demonstrating or explaining them.

4. The general use of objects, specimens, and models may be used

as a means of training pupils to take good care of possessions.

5. Work with them frequently leads the learner into hobby activities.

B. Some possible limitations to be considered when these materials are to be used are:

1. It is possible that materials of this type can be misinterpreted when they are considered out of their natural settings.

2. Materials of this type frequently take up much space for storage or display and are bulky and fragile to ship.

3. Materials of this type are frequently expensive to secure and require much maintenance.

4. Unless chosen with discrimination so that really good models are selected, this kind of material can give inadequate or inaccurate impressions.

C. Some principles of using objects, models and specimens for learning purposes:

1. The learner should participate actively when they are used. He can demonstrate or explain the material or the collection or preparation of it can be one of his responsibilities.

2. The use of these materials should include practice in the observation of all important details.

3. When they are used, such materials should be made a basis for learner preception of inferences that may extend beyond the obvious physical facts.

4. The use of objects, specimens and models should lead to further activity on the part of the learners with whom they are used.

5. Classroom use of these materials should follow the general principles of good use of audio-visual materials in which these steps occur:

a. Selection of material for definite purpose.

b. Arousing of learner interest in material to be used.

c. Presentation of material in such a manner as to call for participation of learners as far as possible.

d. Evaluation of learnings.

e. Development of follow-up activities.

D. Some principles to be observed in starting and administering the school museum.

1. The school museum should be regarded as a part of the regular educational program of the school and as such should be under the care of a staff member who is granted freedom from other duties in proportion to the time he must spend to accomplish the museum objectives of the school.

2. Museum exhibits and activities should fit in with the regular educational program of the school. They should be planned around definite topics which are considered valuable by the staff of the school and should contribute to the effectiveness with which those topics can be considered in the classes.

3. Exhibits should always tell a story. Avoid a collection of oddities. Think of the school museum not as a place where rare objects or curios are stored, but as a means of telling stories through exhibits that will contribute to a better understanding of the world in which the child must live and work.

4. Plan exhibits for the children who are to use them. Make use of color to give appeal. Place exhibits on child's own eye level. Emphasize exhibits that the child can touch and

work or see working or exhibits that can be taken out on a library loan basis.

5. Be sure that every exhibit is clearly explained by means of legible cards when an explanation is needed.

6. Place exhibits where they will be used most effectively. For example, there is no reason why all exhibits should be in one isolated room or hall. Science exhibits might be placed where science classes will see and use them. Historical exhibits might be placed in history rooms. In such cases the specializing teachers might assist with this part of the school museum program.

7. Enlist aid of pupils in assembling materials for school museums. Over a period of time many valuable exhibits can be assembled as an outcome of class projects undertaken as a regular part of class study.

8. Observe four principles of good display in planning exhibits:

a. Show stages of development

b. Show how the exhibits work

c. Relate the displays or parts of the displays to each other.

d. Show clearly the relationship of the displays to the present life of the learners.

E. Some sources of objects, specimens and models:

1. The local audio-visual center.

2. Commercial producers of exhibits for educational purposes.

3. Local museums.

4. Pupil collections and home museums.

5. Commercial organizations and manufacturers who wish to advertise their products.

6. Teacher and pupil-made materials.

7. Other schools which may be in this or other nations.

Topic Four. Maps, Globes, Charts, Diagrams.

These materials are essentially *symbols* and as such they require a clear understanding of what they represent before they can be used effectively. However, since they are symbols which are usually more understandable than word symbols, their value for instructional purposes is high.

A. Maps and Globes

1. The chief function of maps and globes is to show:

a. Locations

b. Directions

c. Relative distances

d. Relative sizes

e. To give factual information about geographic and political areas, such as

(1) physical forms

(2) climatic conditions

(3) political divisions

(4) time relationships

(5) historical settings and movements

(6) lines of communication and transportation

(7) cultural activities

(8) planning, charting, and organization

(9) statistical information

(10) probable changes in status

(11) population distribution and density

B. Cautions to be observed in the use of maps.

1. There will be a need to clarify the inaccuracies of flat representations of the round surface of the earth. The most common flat projections are:

a. Mercator, or cylinder, projection. Here the polar regions are badly distorted by being made to conform to the rectangular shape of the map. In the Mercator projection both land areas and ocean areas are distorted. In the case of equal land area maps the land areas are held to fairly true areas and the distortion occurs in water areas.

b. Conic projections. In the case of these maps, the equatorial areas are given in fairly true proportions and the polar regions are squeezed into a cone shape at the top and bottom of the map to give a more true representation of land and water areas than is possible with the rectangular map.

c. Visual projections. Here the earth is viewed as it would appear from a point far out in space. Only about half of the world can be shown at any one time and there is much distortion, but since we are accustomed to looking at one side of a ball, it is not too hard to interpret. Parts of this map lying in the center have the least distortion with distortion increasing rapidly toward the edges.

All of these types of projections are inadequate for purposes of showing the entire surface of the earth and should be used only in cases where a globes can be consulted so that true areas, distances and proportions can be observed.

2. The instructor must be certain that the map symbols are understood or the value of the map is lost.

3. There is a need to develop a good concept of "scale" especially where maps drawn to different scales are being used together.

4. Maps should be chosen to suit the maturity level of the learners with whom they are to be used.

C. Some principles to be observed in introducing study of maps with young children:

1. Develop an understanding of how maps graph distances by having young children map familiar places, such as the classroom, the school and school grounds, and the city block in which they live.

2. Study maps of familiar places, such as maps of the town or city. Have pupils recognize and interpret the common map symbols.

3. Be sure that the pupils understand why a map is being used in a specific lesson and that they are familiar with the symbols they need to know in order to derive the needed information from the map.

4. Where a map is being used for a specific purpose, avoid cluttering up the lesson with details not then essential.

5. Make a generous use of other audio-visual aids to supplement map information and to make it realistic to the students. For example, a map of the west showing Death Valley might indicate that the place is dry and hot, but since some of the learners might not have a clear idea of what that means it would be wise to use slides, still photos or motion pictures to give a vivid impression.

D. Some principles to be observed in using maps with older students.

1. Be certain that the learners know the map symbols for which they will have use. The age of the child is not a guarantee that he will be familiar with map use.

2. Have a definite purpose for us-

ing the map and select a map that will accomplish that purpose.

3. Supplement the map with other audio-visual aids.

4. Call for pupil interpretations of maps as a means of making certain that they understand what the map presents.

5. Select maps that give the least distortion of the areas with which the lesson is concerned.

6. Have pupils make simple maps of nearby localities as a means of developing clear understandings of the nature of map meanings.

Charts and Diagrams

A. Common types of charts and diagrams.
   1. Graphs.
   2. Drawings.
   3. Bar charts.
   4. Area charts.
   5. Solid diagrams.
   6. Pictorial statistics.
   7. Numerical charts and diagrams.

B. The chief function of charts and diagrams is to present information through the use of symbols which may be more easily understood than word symbols because they indicate relative areas, amounts, changes, numbers and because they may resemble clearly the materials to which they refer.

C. Some limitations to be considered in using charts and diagrams:

1. They require interpretation of symbols.

2. They may present a distorted view of a situation.

3. They have to be accurate in order to be useful.

4. There are many types and the use of each type will probably require a separate explanation of the symbols used.

D. Some principles underlying effective use of charts and diagrams:

1. The learners must be able to interpret the symbols used. It may be desirable and even necessary to have students make simple charts to develop the ability to interpret symbols accurately.

2. The charts and diagrams must be related directly to the topic being studied.

3. The charts and diagrams must be legible to the learners. If they can't be seen clearly, they can't be interpreted.

4. Suit the charts and diagrams to the maturity level of the pupils with whom they are to be used.

5. Check pupil understanding of the charts and diagrams by calling for an interpretation of them by the learners themselves.

Topic Five. The Flat Picture.

By flat pictures we mean any pictorial material printed, drawn, engraved or reproduced photographically on flat material such as paper or cloth.

A. Some values to be found in the use of flat pictures:

1. They may possess considerable realism and may, therefore, be used as a means of giving pictorial representations of a great variety of subjects which do not depend upon motion for a clear representation of their nature.

2. They are plentiful and cheap; pictures pertaining to almost any topic can be collected easily.

3. The learner can examine a flat picture at length and can even take it home with him. This adavntage is not always found in the slide or motion picture. All too frequently these materials must be returned after being used once with a class.

4. Flat pictures of suitable size may be projected by means of an opaque projector for simultaneous examination by a large group.

5. The gathering of flat pictures may be a learner activity of value.

6. Flat pictures can be filed for future reference.

7. By means of amateur photography both instructors and learners may secure valuable and comparatively inexpensive records of local materials.

8. These materials can be used to stimulate creative writing and creative play.

B. The requirements of a good flat picture.

1. The reason for the picture must be clearly apparent.

2. It must be realistic and accurate in terms of content.

3. It must be technically good, in focus and with good tone values.

4. It should show relationships by making use of comparisons, by showing necessary details and by the photographic method of treating the subject.

5. It should make use of the principle of continuity of thought where ever this is possible.

C. Some educational purposes for which flat pictures may be used.

1. To introduce and arouse interest in a topic.

2. To explain unfamiliar aspects of a study topic.

3. To introduce related materials in a study unit.

4. To summarize the materials covered in a study topic.

5. As a means of stimulating the drawing of further inferences with regard to a study topic.

6. For purposes of testing the comprehension of the learners.

7. To provide opportunities for learner participation in carrying on a study unit.

D. Some principles of using flat pictures for educational purposes:

1. Use only pictures that can be seen by all members of the class. It must be large enough so that all can see or must have been displayed on a bulletin board until all have seen it or placed in each person's hands for examination.

2. Select pictures that serve the purpose at hand.

3. Use the picture to put across the principle idea and then draw out as many other inferences as are needed. Remember, it is necessary to train learners to "read" pictures in order to get their full value. Be sure inferences are based on logical details.

4. Summarize by reviewing what the pictures have shown.

Topic Six. Slides and Slidefilms.

Slides usually come in two sizes, the standard lantern slide which is 3¼ by 4 inches in size and the 2 by 2 inch slide.

The slidefilm, also known as the filmstrip, is a strip of 35 millimeter film on which a series of still pictures are printed for projection. It gives a series of still pictures which cannot get out of order because they are printed in a definite sequence.

A. Some values to be found in the use of slides and slidefilms:

1. They possess great realism and may be used to depict accurately almost any subject that does not require motion for an understanding of its nature.

2. They may be viewed by the class at one time and thus serve as a means of focussing the attention of all learners on the topic at hand.

3. They may be kept before the class for close examination of all important details and can be changed when the instructor is certain that their usefulness has served its purpose.

4. The equipment for their projection is comparatively simple to operate. Standard lantern slides may also be used effectively in rooms that cannot be darkened enough for other types of projected materials.

5. Slides and slidefilms are comparatively inexpensive and have relatively long life when given good care.

6. With simple camera equipment it is possible to make slides and filmstrips of items of local interest. Of particular value is the 2 by 2 inch color slide which can be made by any amateur photographer at little expense.

7. The production of slides, and even slidefilms, can be a learner activity of much value.

B. Some principles of good use of slides and slidefilms:

1. Select slides and slidefilms with a definite objective in mind and get materials that will accomplish this objective.

2. Arouse class interest in the materials to be used and prepare them to look for the information that is to be presented.

3. Project slides under the best possible conditions. Where the class is not required to write during the showing of the slides, a completely dark room will enable the presentation of the slides to best advantage and will also tend to keep the attention of the learners focussed on the pictures shown on the screen. A rehearsal of the projection is desirable unless the operator is sufficiently experienced so that there is little danger that they will be shown upside down, left to right, or out of order.

4. Show only as many slides as are needed to tell the part of the story with which the class is concerned. No hard and fast rule can be given because the nature of slides is so varied. However, any good slide is probably worth several minutes of detailed discussion. With young children in about the first three or four grades from five to ten slides should be adequate for a single class period. In some cases, particularly in the case of slidefilms, the material is planned to tell a story by a continuous succession of pictures. Many of the pictures might be worthy of little comment or time and others would call for much study. The nature of the slides, the maturity level of the learners, and the teachers objectives must determine how slides are to be used.

5. The drawing of *inferences* from slides is an important part of teaching by use of still projected pictures. This type of work gives learners practice in observing details and in deciding what they mean with reference to the chief purpose of the slide.

6. Following the showing of slides it is desirable to review the information given by the slides to further impress it upon the minds of the learners.

Review may be by means of questions, quiz contests, written reports by class members, a summary of members of the class or any review devices. But review!

C. Some criteria for judging slides:

1. They should bear directly upon the unit of study.
2. They should be suited to the grade level for which they are intended.
3. They must be accurate with respect to photographic treatment of subject materials.
4. The relative size of items shown should be indicated by comparisons with familiar objects.
5. The photographic quality of photographic slides should be good.

D. Mistakes frequently made when slides and slidefilms are used:

1. The slides do not pertain to the unit of study and are brought in merely for entertainment and with no definite educational purpose in mind.
2. Slides are presented without preparing learners for what they are to see.
3. Slides are unrelated or are shown so rapidly that learners fail to get all information they might have gotten if slides had been shown correctly.
4. Projection techniques are poor and the effectiveness of the content of the slides is diminished because of pictures difficult to see or because of other distracting elements.
5. The use of the material is not accompanied by class discussion to bring out important items of information that each member of the class should get.
6. Little or no attempt is made to use the slides as a means of motivating various types of pupil activities.
7. The slides are used at the wrong place in the lesson for most effective results.

Topic Seven. Radio and Recordings.

A. Some important values to be found in the use of radio for educational purposes.

1. Timely events can be brought into the classroom as they happen.
2. Great personalities of our times can be made real to learner through actual radio contact.
3. Some of the finest talent in the world is used in giving of good educational and appreciational programs.
4. A good radio is comparatively inexpensive in comparison with other audio-visual equipment and the cost of program materials is nil for the individual school.
5. The technique of radio dramatization has great appeal for boys and girls.
6. The technique of radio dramatization offers a powerful means of affecting attitudes and behavior responses.
7. The use of radio injects variety into the school program.
8. Radio production activities can be valuable learning activities.
9. Through the use of radio it is possible for persons with exceptional abilities or talents to reach learners who could not otherwise have the advantage of their teaching.

B. Some limitations of radio:

1. Desirable educational programs are limited in number. At the present time schools must depend almost entirely upon the few good public service programs prepared for school use.

There is an urgent need for a system of school owned and operated educational radio stations which can offer the kinds of radio materials needed by schools.

2. Many good educational programs are put on at times when they cannot be used for classroom instruction.

3. It is difficult to learn the exact nature of many possible programs in advance so that adequate class preparation can be carried out.

C. Some values of recordings or transcriptions:

1. Through recordings it is possible to preserve spot news occurrences and use them at later and more convenient times. This is also true of program materials that are not spot news but which may be offered at times when they cannot be used by classes.

2. It is possible to hear recordings in advance and to plan for their use.

3. Recordings provide realistic auditory impressions that are lacking from other types of audio-visual aids except radio and sound motion pictures.

4. Recordings may be used in whole or in part, and any part may be used first.

5. Recordings may be repeated immediately or at a later date if this repetition is needed.

6. The use of recordings brings variety into the classroom experience.

7. With equipment that is within the budget requirements of the average school system, events of local community importance may be recorded for later use in the classes of the schools.

8. School-made recordings can be used to preserve the results of radio presentations prepared by various classes.

D. Some limitations of recordings:

1. Recordings lack visual impression and should often be supplemented by other means of giving these impressions for best results.

2. Although recordings, theoretically, make available the best in radio program materials for school use, actually only a small fraction of these programs may be secured in the form of transcriptions. At the present time union regulations prevent the commercial release of transcriptions made of many excellent radio programs in which union musicians have played.

3. Comparatively little material has been produced in the form of transcriptions for school use. This statement doesn't apply to musical recordings of which there are an abundance, but to transcribed dramatizations and complete lessons.

E. Some principles of good use of educational radio and transcriptions:

1. General considerations: Both media are auditory impressions and since the attention span of boys and girls to purely auditory impressions is more limited than when the material used appeals to several senses, this must be taken into consideration when the lesson is planned. Short radio programs and recordings are indicated except in instances where the materials have enough dramatic interest to sustain attention over a longer period of time. In all cases a teacher should be extremely wary of materials that extend over a period of more than thirty minutes.

2. Select radio or recorded materials that will meet a specific purpose in the unit of study. Avoid including something just for variety unless it also contributes to the purpose at hand.

3. Create pupil readiness for the radio program or transcription just as would be done in the case of slides or a motion picture.

4. Follow the use of the materials with a discussion in which the types of information that the class was expected to get from the material are clearly brought out.

5. Develop any inferences that can be obtained from the materials.

6. Discuss mistaken ideas that existed before the material was used or mistaken ideas that might have been gained from the material.

7. Locate new thoughts that extend beyond the present topic and offer possibilities for future class study.

8. Plan for learner activities that might well spring from the use of radio or recorded materials.

F. School sponsored radio programs. At the present time one of the valuable educational uses of radio is as a means of motivating pupils to take part in production activities that have considerable learning value.

1. Approach local broadcasting stations to find if it is possible for your classes or your school to sponsor one or more programs. All stations have to devote a portion of their time to public service programs by edict of the Federal Communications Commission so many of them are willing to cooperate if you can offer simething of interest.

2. Gain the permission of your principal, superintendent of school, and the school board before you engage in this activity.

3. Plan carefully the type of program that can be presented most effectively by your pupils.

4. Arouse interest among your students and use this interest to motivate their activity in preparing for the giving of the program. Some possible types of school-sponsored broadcasts are:

a. Appreciational programs sponsored by music, choral or dramatic groups.

b. Student discussions of timely topics.

c. Student dramatizations of documentary materials or events of importance to the community.

d. Student interviews with persons of importance who come to the community.

e. Student interpretations of the educational program of the school as a community agency.

5. Rehearse pupils carefully before making the presentation. The actual giving of the program might be organized as a field trip experience for the pupils involved or for children who are not actually taking part in the program. In some cases it has been found desirable to make a transcription of the program and to present the program as a transcribed one. This has the advantage of enabling the children to make several "takes" if they are needed and also gives them the opportunity to listen to their own program when it is broadcast later.

6. Follow the student broadcast with discussions of means of improving future broadcasts and with the

securing of suggestions of possible topics for future broadcasts.

Topic Eight. The Educational Motion Picture.

A. Some important educational values that can be gained from the use of motion pictures:

1. They offer one of the most effective means of presenting concrete, factual materials of all kinds.

2. They contribute significantly to permanence of learning.

3. They catch and hold attention.

4. They offer an instructor one of the most effective means of bridging inequalities of background experience, intelligence, language comprehension and maturity.

5. They are an especially good tool for showing relationships within a situation e.g. social relationships, time relationships, physical relationships, and the like.

6. Experiments have shown that they can contribute significantly to the exercise of creative powers.

7. The use of films tends to increase student thinking about the study material.

8. Because of their realism and ability to show motion, they are good for the purpose of teaching actual skills that must be observed before they can be imitated successfully.

9. They offer the instructor one of his most powerful means of influencing attitudes and emotions.

10. They can be used to instruct small or large groups with almost equal success provided follow-up activities are substantially the same for the members of the groups.

D. Educational purposes for which motion pictures may be used:

1. To introduce a topic of study.

2. To present the facts and concepts of an educational unit.

3. To enrich or extend a unit.

4. To give a rapid survey or provide a general background.

5. To summarize or review.

6. To provide visual interpretations of educational undertakings for public relations purposes.

E. Some fundamental techniques of teaching with the use of educational films:

1. First, select the film with a definite purpose in mind. Make sure the film will serve the purpose by previewing it or scanning a detailed summary of the film story.

2. Make definite plans for the use of the film. This step might be taken in connection with step 3.

3. Develop pupil readiness for the film by:

a. Arousing interest in the topic.

b. Appealing to their past experiences.

c. Determining with their help what they should look for in the film.

d. Deciding what other materials might also be used to supplement the film.

4. Present the film in the most effective manner. Of course projection conditions should be satisfactory. Some methods of presention are:

a. Show the film as it is with sound if it has sound.

b. Show a sound film as a silent film but with teacher and pupil comments.

c. Save all questions until the end of the film.

d. Permit interruptions for questions at any time.

e. Show the film all the way through the first time and then show it again permitting comments as it is shown.

f. Use only part of the film to develop a specific purpose.

5. Discuss the film after showing. This discussion should bring out the following kinds of things:

a. The film facts that pertain to the study topic.

b. Generalizations that may be drawn from the film.

c. Inferences that can be drawn from the film materials.

d. Mistaken ideas that existed before the film was used.

e. Mistaken ideas that may be a result of the film showing.

f. A statement of new ideas that call for further study.

6. Examples of types of learner activity that can logically follow the use of a good film:

a. Discussions.

b. Individual reports on aspects of the film or reports that carry further the film given materials.

c. Debates.

d. Quiz games.

e. Impression writing.

f. Field trips to carry further the ideas of the film or to explore thoughts suggested by the film.

g. Learner production of other audio-visual materials that pertain to the study.

h. Collections of objects, specimens, or models to amplify the film.

F. Errors frequently made in using films for teaching purposes:

1. Film is selected by means of insufficient description and doesn't pertain to topic or is of little value.

2. Pupils are not prepared for the film they are to see.

3. There are no follow-up activities after film use.

4. Long films are used that either bore classes or give so much information the pupils are bewildered.

5. Several unrelated films are used at the same time.

6. Poor projection conditions exist when the film is shown:

a. The room is not darkened sufficiently.

b. The projection machine is jumpy or out of repair so that sound is poor.

c. The room is stuffy or seats are uncomfortable.

d. There are distracting elements in or near the projection room.

e. The operator is poorly trained and does not keep picture in focus or maintain sound at a comfortable level.

7. The film is used at the wrong place in the lesson.

8. A valuable film is given such limited use that most of its value is wasted.

Topic Nine. Administration of the Audio-Visual Program

A. Chief objectives of the audio-visual program:

1. A teaching staff that is able and willing to make effective use of audio-visual materials.

2. An adequate library of audio-visual materials. In order to be adequate, the materials must include the best of existing materials selected in terms of curriculum purposes and available in sufficient quantity to enable teachers to secure what they want, when they want it and to keep it for as long as it is required.

3. Adequate equipment to make possible convenient and effective use of all types of audio-visual materials. This implies that every classroom must be equipped so that projection and playback equipment can be used and that projectors, playbacks, and other audio-visual equipment must be available easily when needed and for as long as required.

4. A guide to all available materials, equipment, and services. In order to be most effective this guide must be in the hands of every teacher and must be kept up to date.

These broad objectives include a great variety of things that can be done within individual schools but they also include many things that most individual schools cannot accomplish without aid. For example, it would be prohibitively expensive at the present time for the average school to attempt to maintain a library containing all the audio-visual materials that might be needed by the teachers of the school. For this reason the audio-visual program can be considered from these two aspects:

1. The work of the audio-visual or curriculum materials center.

2. Organization of individual schools for use of audio-visual materials.

B. The work of the audio-visual or curriculum materials center.

In general the audio-visual center should do only those things for the schools that they cannot do efficiently for themselves. Among the kinds of things that this criterion would cover would be:

1. The center should provide a central library of all materials and equipment which it is not economic to attempt to keep on hand in each school.

2. The center should sponsor an active program of in-service teacher education among all schools served.

3. Advisory services should be given the schools to assist them in choosing suitable audio-visual equipment and materials.

4. The center should develop and distribute a satisfactory guide to audio-visual materials, equipment and services available through the center.

5. The center should carry on production activities as a means of making available materials needed by the schools which cannot be secured from the usual commercial sources. An aspect of this service would be the giving of assistance to schools engaged in production activities as a part of their learning activities.

6. The center should have chief responsibility for coordinating educational and public relation radio activities among the schools served.

7. The center should provide schools with aid in keeping equipment in good operating condition.

8. The center should provide central preview and listening facilities and should take the initiative in calling together representatives of the schools for preview meetings and other occasions when it is desirable for them to act as a body. It is up to the center to see that all schools are represented in planning and carrying along the total audio-visual program.

It follows that the center must be given staff and building facilities and funds with which to carry out these duties. The work of the center should be coordinated by a director of audio-visual education assisted by audio-visual librarians, technicians, field

supervisors, and clerical help required for the situation to be served.

C. Organization of individual schools for the use of audio-visual materials.

1. Organization within the schools must be determined by the kinds of things that have to be done to enable teachers to use audio-visual materials most effectively. In general these are:

a. Materials must be ordered.

b. Materials must be received, distributed to teachers who are to use them, and returned to the center.

c. Teachers must be given on-the-spot advice concerning problems that arise when materials are used.

d. Rooms must be made ready for the use of materials.

e. The materials must be used for instructional purposes.

f. Rooms must be returned to normal and equipment must be put away.

g. Equipment must be serviced and carried around the school.

h. Equipment must be selected and purchased.

i. Communications from the audio-visual center must be given to the faculty and the wishes of the faculty must be made known to the staff of the center.

j. Pupils who assist with the audio-visual program must be trained and supervised.

k. Materials owned by the school or on permanent deposit in the school must be cared for and circulated when needed.

l. The faculty should be kept abreast of significant happenings in the field of audio-visual education.

m. Special programs must be planned for school auditorium programs or for PTA meetings.

2. In order that the things listed above may be done well in the school, the following organization adapted from recommendations by Helen Hardt Seaton in *A Measure for Audio-Visual Programs in Schools* is suggested:

a. Responsibility for coordinating the audio-visual activities within a school should be under the general direction of a person who has the leadership ability, the special training, and the interest in the work to supervise the school program successfully. The activities of the coordinator should include the following:

(1) He should distribute the guide to audio-visual materials and keep the staff informed concerning materials added to the audio-visual library.

(2) He should collect and send to the audio-visual center all orders for materials and equipment.

(3) He should supervise the receiving, distributing to the teacher, picking up from teachers, and the returning of all materials and equipment ordered for use in the school.

(4) He should give other teachers advice on the selection and use of materials and equipment and should cooperate with the staff of the central office in carrying on a planned program of in-service teacher education.

(5) He should train and supervise the staff of pupil assistants.

(6) He should make recommendations regarding the securing of needed equipment and the improvement of building facilities.

(7) He should supervise the

care of all equipment and all room installations.

(8) He should maintain liason between the school and the audio-visual center.

(9) He should work to extend the use of audio-visual materials as aids in carrying on school recreation, public relations activities, and the like.

(10) He should supervise the care and distribution of all audio-visual materials owned by the school or placed on permanent deposit in the school unless this work can be carried on more effectively by the school librarian.

It is essential that the coordinator receive time in his schedule for doing these duties. In a large school it is possible that a person might spend one-half of all of his time carrying on these activities. In a small school they might be done during a few minutes each day.

b. There is need for a staff of pupil assistants trained to help with the carrying on of the school audio-visual program. Some of the ways in which pupils can be of help are:

(1) They can deliver and call for audio-visual materials used in the various classrooms of the school.

(2) They can prepare classrooms for the use of audio-visual materials by darkening them, setting up equipment and doing other similar tasks.

(3) They can actually operate equipment and free teachers to give their full attention to the lesson.

(4) They can pack up and return equipment and set the room in order.

(5) They can clean, oil, and test equipment when they have been selected and trained for this work.

In some schools a small group of pupil projectionists have served all grades. This is not recommended because it usually causes some pupils to miss their regular classwork. It is recommended that every class have two or more pupil assistants to do this type of work.

D. The basis for financing the audio-visual program.

Only one true basis for financing the audio-visual program can exist and that is the need of the specific educational situation. This need can be determined only by a survey of what materials, staff, building facilities are required and what operating expenses must be met in working toward the four chief objectives named at the beginning of this section. When the extent of the need is recognized a sound basis is laid for requesting needed funds in terms of the total available budget and the contribution that the audio-visual program can make to the education program as a whole.

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AND
JAMES McPHERSON

THE following materials have been selected for their value as means of illustrating values and uses of audio-visual materials. This listing was developed as a report of a sub-committee to the joint committee on Audio-Visual Education of the California School Supervisors association and the Audio-Visual Education Association of Southern California with Miss N. Evelyn Davis, director of audio-visual education for Long Beach City schools, as chairman. At the end of the list the full addresses of all sources are given.

Motion Pictures

THE AIRPLANE CHANGES OUR WORLD MAP 10 minutes sound price $50.00
This film describes the evolution of the various world map concepts and tells how the airplane has caused our thinking about maps to change. Sequences briefly cover the problem of projection distortion, early maps and globes, latitude and longitude, and distance contrasts by land, water, and air. Recommended as an excellent film to use when making a study of maps with pupils in grades six through twelve. Can also be used to aid teachers who are planning to use maps in their teaching.
Encyclopædia Britannica Films

AND SO THEY LEARN 13 minutes sound free loan
A recording of day-by-day experiences in a nutritional workshop conducted for elementary grade teachers at Mankateo State Teachers college, Minnesota. This film shows how nutritional information can be integrated into regular classroom studies by means of activities which include children's participation in planting a garden, designing and painting a mural, planning picnic menus, and conducting animal experiments in relation to balanced diets.
General Mills

BRING THE WORLD INTO THE CLASSROOM 20 minutes sound price $76.50
By means of a large number of sequences chosen from their films, Encyclopædia Britannica Films show how motion pictures can be used to surmount barriers of time, distance, physical hazards, limitations of equipment, intellectual differences, and other restrictions on learning. This film was judged to be of value for the purpose of showing teachers who have had little experience with films some of the possibilities they offer as learning aids. It was also considered excellent as a means of giving lay groups an understanding of the potential values of educational films.
Encyclopædia Britannica Films

CAUGHT MAPPING 10 minutes sound free loan
A film that shows how road maps are prepared and are constantly kept up to date. Quick printing methods are illustrated. No advertising. Available from General Motors corporation, Broadway at 57th street, New York City. Some school libraries have secured this film for long term deposit.

FILM TACTICS 22 minutes sound price $28.56
This film was developed and used by the Training Aids section of the navy for the purpose of improving utilization of training films. It illustrates right and wrong methods of using films and other audio-visual aids for instructional purposes.
Castle Films

LESSONS FROM THE AIR 14 minutes sound price $37.50

This film explains how the British Broadcasting company is cooperating with British public schools by producing regular radio lessons which are broadcast on a schedule for all schools. Emphasis is placed on the fact that broadcasts are planned by an expert panel on which classroom teachers are represented, and are produced by professional radio talent. Numerous illustrations selected from typical programs are given.

British Information Offices

LESSONS IN LIVING 16 minutes sound free loan

This film shows how a small rural school made use of resources of the school community to develop a vital program of education.

National Film Board of Canada

MAPS ARE FUN 10 minutes sound, color price $75.00

Two boys visit a cartographer, or map maker, to get aid with a map one of them is making of his paper route. The cartographer shows them how they must make use of scale, symbolization, and direction in making a simple map. Numerous other facts concerning maps are also brought out. This film was considered by reviewers to be of value for use with children who are starting a study of maps, and also as a guide for teachers who are planning to use maps with younger children.

Coronet Films

NEAR HOME 25 minutes sound

A teacher explains to her children how they can learn about their city by dividing into small groups to visit and study industries, public services, historical places, and other aspects of city life. The film shows how this was actually done and how the pupils prepared maps and charts as a means of presenting their findings to fellow pupils and visiting parents.

British Information Offices

SIGHTSEEING AT HOME 20 minutes sound free loan

This film explains that television has reached a highly perfected stage and is now highly suitable for home and other uses. The principles of television are briefly and clearly illustrated and explained by means of animated and live action sequences. The making of a typical telecast over a television station is shown in detail.

General Electric company

THE STORY OF FM 20 minutes sound color free loan

The film explains in easily understood form the differences between regular amplitude modulation broadcasting and the new frequency modulation broadcasting. The special advantages of FM are emphasized. In view of current interest in educational FM networks, teachers should find this an interesting film.

General Electric corporation

USING THE CLASSROOM FILM 20 minutes sound price $85.00

Correct practices in making effective use of a classroom film are shown in detail. The importance of teacher preparation, class preparation, good presentation, and related follow-up activities are emphasized by illustrating how a teacher made good use of the film, with his class. Judged to be an excellent film for teacher training purposes by board of reviewers.

Encyclopædia Britannica Films

WHAT IS A MAP 10 minutes sound price $50.00

A visual lesson in basic map reading is given in film form. Because map symbols are abstract, the camera is employed to give concrete expression of their meanings. Viewers actually see a room from above and watch each piece of furniture fade and be replaced by its outline so that a map of the room is provided. The same procedure is then applied to a small town.

Teaching Films, Inc.

WILLIE AND THE MOUSE 10 minutes sound 3 year lease price $30.00

Experimental studies on the learning habits of white mice have taught educators much concerning the learning habits of children. This film shows that some mice learn by sight, some by hearing, and some by touch. Thus, it is indicated that there is a need to provide many avenues for learning to meet the needs of all types of learners. Although not specifically mentioned, it can be deduced that the various types of audio-visual aids should be of great use in providing varied learning experiences that can be understood by all types of learners.

Teaching Film Custodians

Slidefilms

THE FIELD TRIP color price $6.50

This slidefilm was prepared to show how a field trip to an airport was planned and carried out by a group of children. All pictures are in cartoon form and combine humor with good suggested techniques. Judged excellent for the purpose of arousing interest in school excursions among elementary grade children.
Simmel-Meservey

THE SLIDEFILM IN TEACHING black and white price $1.00

By use of cartoon techniques this slidefilm shows the chief educational purposes for which slidefilms can be used and suggests good techniques to be followed in making effective use of them. It was prepared expecially for teacher training purposes.
Young America Films

TIPS ON SLIDEFILMS black and white

Produced to show the correct mechanics of using slidefilms and to illustrate the use of the S.V.E. model AAA slidefilm projector.
Jam Handy Productions

Transcriptions

THE BIRD MAN speed 33⅓ rpm 15 minutes each side price $12.50

The story of John James Audubon who, according to his wife, "must have been a genius since he certainly wasn't anything else." Audubon's experiences leading to the epic "Birds of America" form a major part of the dramatization. The study guide recorded on one side of the transcription can be used to show teachers how recorded materials can be used effectively.
Training Aids, Inc.

DIVIDING A CONTINENT speed 33⅓ rpm 15 minutes each side price $12.50

The story of the Panama Canal and its builder, George Washington Goethals. A vivid account of the man and one of the greatest engineering feats of all time. The teachers guide recorded on one side of the transcription can be used to show teachers how they can make effective use of this and other recordings.
Training Aids, Inc.

THE OUTRAGEOUS TOY speed 33⅓ rpm 15 minutes each side price $12.50

An account of the miracle that made a hundred million people neighbors, and of the man who brought it about, Alexander Graham Bell. One side of the transcription gives a recorded guide for teacher and pupils that will enable them to make most effective use of this and other recorded materials.
Training Aids, Inc.

SPLENDID LEGEND speed 33⅓ rpm 15 minutes each side price $12.50

A portrait of Mark Twain, whose own experiences were more fabulous than any he created for his readers. The dramatization traces his career from bad boy, cub river pilot, soldier, to his place as America's favorite humorist. One side of the transcription gives excellent suggestions for the use of the material and also might be used as a guide in planning the use of other similar transcriptions.
Training Aids, Inc.

Sources of Audio-Visual Materials Listed

British Information Office, 30 Rockefeller Plaza, New York 20, N. Y.

Castle Films, RCA Building, Rockefeller Center, New York 20, N. Y.

Coronet Productions, 65 E. South Water street, Chicago 1, Ill.

Encyclopædia Britannica Films, 20 North Wacker Drive, Chicago 6, Ill.

General Electric Corporation, Publicity Department, 1 River Road, Schenectady 5, N. Y.

General Motors Corporation, Broadway at 57th street, New York 19, N. Y.

Jam Handy Organization, 2900 E. Grand Blvd., Detroit 11, Michigan or 1775 Broadway, New York, N. Y.

National Film Board of Canada, 84 E. Randolph street, Chicago, Ill.

Simmel-Meservey, Inc., 321 South Beverly Drive, Beverly Hills, Calif.

Teaching Film Custodians, 25 W. 43rd street, New York 18, N. Y.

Teaching Films, Inc., 2 West 20 street, New York 11, N. Y.

Training Aids, Inc., 7414 Beverly Blvd., Los Angeles 36, Calif.

Young America Films, 18 East 41 street, New York 17, N. Y.

The Use *of* Audio-Visual Aids *in the* Study *of* Spanish *in the* Junior High School

By MABEL CLAIRE KEEFAUVER
Teacher of Spanish, Los Angeles City Schools

MORE than three hundred years ago, Quevedo, the brilliant, cynical satirist said: *"Poderoso caballero es don Dinero"* . . . powerful gentleman is Mr. Money!

That is as true today as it was yesterday. And it automatically divides the audio-visual aids to be used in the study of Spanish into two groups: those that cost money, and those that do not—that is, do not cost much money. Everything costs something.

Whereas Quevedo was inclined to be cynical and satirical about the value of money, we can be more realistic and calm. Audio-visual aids that do not cost much money can become a part of the students' experiences. For this reason they are highly effective.

One of the most delightful and time-honored visual aids is the neighborhood store transferred to shelves within the classroom. This is a natural continuation in junior high school of the elementary school store where functional English and arithmetic first were practiced. The same teaching and learning pattern can be used for the spontaneous acquisition of a foreign language. More years ago than it is pleasant to enumerate, my seventh grade teacher encouraged us in our study of Spanish by creating within the classroom a life-like situation wherein we could discover for ourselves that we could use what we were studying. My students today seem to enjoy going to the store "in Spanish" as much as I did years ago.

The collection of the visual aids, the objects to be sold in the store, affords a splendid opportunity for student activity, resourcefulness, and imagination. They enjoy bringing from home the cans, bottles, and boxes that had contained their favorite foods. All the containers are washed so that the articles on the shelves are as fresh and new as the day they were purchased in the real store. The cellophane bread wrappers are stuffed with confetti, making very realistic looking loaves of bread. One teacher had a pupil whose father worked for an advertising firm which used wax and clay models of food to help advertise frigidaires. Their store was tantalizingly realistic. In our meat department, we had to content ourselves with pictures of steaks, chops, and turkeys cut from magazine advertising and pasted on cardboard. But that homemade realism had its compensations. When the storekeeper excitedly insisted in Spanish that he had a thick, juicy steak for sale, all the time waving the cardboard representation around in the air in his eagerness to express himself in a new language, the ridiculousness of his earnest statements made the other

pupils laugh. In this way there was created that happy, relaxed atmosphere in which a student learns so well because he isn't afraid, because he is learning by doing, and because doing is fun. Most of our fruit was wax fruit from the five and ten cent stores. Local storekeepers with whom students worked or traded donated paper bags of all sizes, and even sales checks to record all purchases. Our money consisted of various sizes and colors of paper money used in games, and even of occupational money garnered from relatives who had been in the war. The metal coins were a collection from all over the world.

After many years of teaching, it still surprises me how much faster students learn a word, how much longer they seem to remember it, and how much more fluent they are in its use when it is actually associated with the object, person, or situation to which it refers. Numbers can be learned and forgotten overnight if they are learned merely as vocabulary words, never to be used. But they seem to stay in mind quite consistently all semester when used to make change for a classmate who comes to trade in the "Spanish" store. Important grammatical principles come to life and actually blossom when applied to concrete visual aids. Take for instance the indispensable fundamental of the agreement of nouns and adjectives. Be sure to have big and little jars on the shelves, big and little bottles of coffee, milk, etc. Then the student can really practice: *un frasco pequeño* . . . or . . . *una botella pequeña,* etc., each student picking up the article as the words are spoken. When the object itself can be visualized and handled, it seems as though the verbal and grammatical symbolism can be visualized and handled too.

The use of these stimulating visual aids can be adapted to any teacher, class, or situation. They are very flexible, and can be regulated to suit any age level or time limit. The foregoing remarks are of course merely indications of what can be done. A whole book could be devoted to the matter, not just part of one article.

Another traditional source of visual aids that stimulates the study and use of a language is the dining table around which family or friends gather to eat and discuss the day's happenings. This teaching and learning situation is adapted from the college custom of maintaining a Spanish, French, or other foreign language table in the dining room where students of that language gather to eat, and where only that language is spoken. The conversations start with and center around the food and other concrete objects on the table. Here again, the association of new words with familiar objects and situations facilitates the mastery and use of another way of saying the same thing.

It is easy to gather odd bits of china, silverware, and table linen and recreate a happy family circle within the classroom. The visual aids become the props in an impromtu play, and the lesson becomes a dramatic performance rather than an uneventful recitation. As in a stage play, much can happen in this familiar setting. The family can decide to take a trip around the Americas. Plans can be made for that trip. Other audio-visual aids can be brought into the scene. Maps, pictures, and phonograph records will be necessary. And here again, as in the case of the store,

the essential grammatical principles of the language really take on meaning when they become embodied within the objects and situations to which they refer. *¡Compre usted cuatro billetes! ¡Comprelos hoy, porque mañana saldremos para la América del Sur!* Buy four tickets! Buy them today, because tomorrow we leave for South America!

Now we move into the realm of audio-visual aids which cost money. Newspapers and magazines printed in Spanish are especially desirable because they afford completely modern news and views. *La Opinión,* the fine Spanish language newspaper of Los Angeles, costs twelve dollars a year and is delivered to the school. Each day a different pupil can show the paper to the class, and read and translate the headlines. Another pupil can select the best picture in the paper to be cut out and added to the permanent collection of pictures kept in a scrapbook. The selection of this picture should be made with the greatest of care. The name of the book might well be: *El Buen Vecino* (The Good Neighbor) or *El Progreso* (Progress). It would contain only those pictures which point towards the progress of inter-American friendship. Mexico City's fine newspaper, *El Universal,* and the two colorful magazines, *Hoy* and *Mañana,* are splendid visual aids. A Spanish language teacher can well afford to subscribe to them herself, if money is not readily available in the school budget.

There are two sets of records which are available audio aids. There is an album of five records spoken by T. Navarro Tomás. They are "Spanish Pronunciation and Intonation Exercises" based on his book, *Manual de Pronunciación Española.* They can be secured from the Linguaphone Institute, Rockefeller Center, New York. Then there are the New World Spanish records, available through Victor Record dealers. They have been made exclusively by native Spanish American speakers. The two sets of records give complete examples of Spanish and Spanish-American pronunciation, and therefore are splendid audio aids for the teacher of Spanish who is not a native herself, and for the students who have never had the opportunity to talk with natives of the Spanish speaking countries. The students derive a great deal of satisfaction and self confidence from studying with these records and realizing that they are able to speak as the native Spanish people speak.

In many of the drama departments today, recording machines of all types are in use to study tone quality and the proper use of the voice. These could be used to great advantage in foreign language classes, too, in conjunction with the above-mentioned records. Students could compare their speech with that on the records. These recording machines were used by the army language classes during the war, and it may not be too long before school budgets can be expanded to include them.

As the audio-visual aids go beyond the limits of homemade possibilities and teacher financed projects, the old refrain of Quevedo comes to mind: *Poderoso caballero es don Dinero!* One begins to figure how that illustrious gentleman, Mr. Money, can be won over to our side. In the years before the war, we used to give student talent shows to make money for all the "extras" we wanted. During the war

years, all of that effort and money went into patriotic work. Now in these post war years, that same money can be well spent on the audio-visual aids which will improve the teaching and learning processes within the daily classroom. Many of them will have to be tested and evaluated before their true value and effectivness are established. This testing and evaluating may have to be done on teacher and student initiative before these aids will be consistently provided for in the school budget. That is as it should be. Taxpayers' money should be spent conservatively. Moreover, students have a tendency to value more highly the things they have to work for. Expensive equipment brought into the classroom will be accepted, but modern equipment bought with the fruits of their own labors and talents will be more deeply appreciated.

A fascinating addition to any language class is a daylight, overhead projector. The teacher or pupil using the projector stands in front of the class, as in a regular recitation. The daylight projector allows the room to be light enough to view one another clearly, to write, and still to see the image projected on the screen. But the advantage of this visual aid which fascinates me is that the handsome slides which can be made so easily on inexpensive etched glass and used over and over again, can capture and hold the pupil's attention which so often wanders off and gets into mischief in the old-fashioned language class. How many times has a student, while waiting for a classmate to finish translating some sentence or conjugate a verb, drawn pictures in his textbook, or carved them on the desk top, or sketched them on a piece of paper which he surreptitiously passes around the room, finally upsetting the attention of the entire class. What a waste of good time and talent, not to speak of vital interest. It's high time these tendencies are guided into legal channels. That spontaneity could be discussed in Spanish. The titles of all those funny pictures could be in Spanish. They could be projected on the screen for the whole class to see and discuss in Spanish. Mischief could become a respectable citizen within the classroom, livening things up considerably. Each student could be held responsible for the making of one handmade slide, and its presentation in Spanish to the class. For the less creative ones, it might be the careful reproduction of the flag or coat of arms of a neighboring America; it might be the words and tune of a folk song. The student could not only prepare the slide and discuss it in Spanish, but also draw up a short test, on the miniature lecture thus presented. The variations are endless. The exciting thing is that the use of this visual aid would stimulate student interest and participation, and help keep the attention centered in one place.

The last and the most important of the audio-visual aids to be mentioned is the motion picture. At this writing, there are no Spanish language films showing Spanish American locales and cultures which are designed especially for use in a language class. This is a development which undoubtedly will occur within the years to come. Its development should be made by the language teachers themselves who know exactly what they need in this respect.

In 1944, the American Council on Education published an unusually fine

book on *Latin America in School and College Teaching Materials.* The chapter on Educational Motion Pictures included these important and revealing statements: "In view of the importance of motion pictures in teaching about foreign countries, this study has shown that an inadequate supply of effective educational films is available on the other American republics. . . . No production has been undertaken specifically for integration within the language courses. . . . It is recommended to producers that the need for additional materials is great and widespread."

Speaking of the films which are available, this authoritative book has this to say: "There is no film included in this study which, if used at the right time and place, will not be of some value to a teacher. However, the weight of the total number of pictures in this study is so heavily on one aspect of the peoples to the south of the United States that it will be extremely difficult for the teacher to make a selection of films which will present a balanced impression. The teacher who uses films has the responsibility of preparing the class for the showing, clarifying points during exhibition, answering questions after the showing, and guiding subsequent activities inspired by the film. In using many of these films, an additional heavy responsibility rests with the teacher—the provision of balance, not of facts and information, which would be comparatively easy, but the balance of impression and understanding. The visual material provides a partial but vivid impression which, if not supplemented and completed by an equally forceful and balanced impression, will create an enduring false concept."

This word of warning must be heeded carefully in all uses of audio-visual aids, either homemade or expensively produced. The use of audio-visual materials makes the impressions more vivid and more lasting. Greater and greater care must be exercised in the selection of the thought content, and of the emotional impact of the work to be projected by the means of the audio-visual aids. It is a challenge which must be met. The National Education Association Research Bulletin for December, 1946, listed as the first major barrier to the wider and more effective use of audio-visual materials in city-school systems, the lack of interest and preparation on the part of the teachers. It may be that this challenge will stimulate the interest of teachers, especially teachers of foreign languages who have it within their power to influence the training of future citizens—citizens who can break down the language barriers which still block the way from full understanding among the peoples of this One World.

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Is Note Taking When Viewing Motion Pictures Effective *in* High School Science?

By W. E. FORD, JR.
Science Teacher, Van Nuys High School,
Van Nuys, California

IT is the practice among many secondary school teachers to compel students to take notes during the showing of films. The purpose of this requirement is two-fold. First, it is supposed to keep the student attentive and alert; second, it aids in maintaining order. It is the writer's contention that compelling students to take notes does not achieve these objectives, but more than that, it is distracting to the student. Good note making is a skill which too few high school students are trained to do under good conditions, let alone in a poorly lighted room and during the showing of a film which moves forward rapidly both as to pictures and commentary.

The writer set about to test the above-mentioned contention. An A-9 general science class at Van Nuys High School consisting of thirty students was selected for the test. This group was rather uniform as to age and I.Q.

Three science films dealing with topics suitable to the general grade level were selected. All were sound black-and-white films of eleven minute duration. After previewing them the writer prepared a list of ten questions on each film.

The first film entitled *The Eyes and Their Care* was shown without warning and with no preconditioning. The second film, *Geologic Work of Ice,* was also shown without preconditioning, but the students were told to take notes during the showing with the idea that they would be used to refer to during the test to follow. This was a duplication of the common practice.

The third procedure was as nearly ideal as conditions at Van Nuys High School would permit. The film selected was *How the Ear Functions.* About two days before the showing, the students were given references to look up. Immediately before the showing a large model of the human ear was brought before the class and its parts were carefully discussed. The students were encouraged to ask all the questions they wished. Guided by student suggestions and the writer's knowledge of the film, a list of the things to look for in the film was written on the blackboard. It was suggested that the students not take notes but instead, watch the screen closely. Immediately upon completion of the film showing the students were given a test.

To each of the three film tests a total of 54 points was assigned. Following are the film tests prepared by the writer:

Test 1

Title: *The Eyes and Their Care* (Encyclopædia Britannica—Erpi Film)

Type: 16 mm. black-and-white sound.

Time: 11 minutes.

1. What was the title of the film?
2. What factors aid our eyes in determining the distance of objects?
3. How do infra-red and ultra-violet light affect the eyes?
4. How many sets of muscles control the movement of the eyes?
5. Where do the blood vessels enter the eye?
6. What vitamin affects vision?
7. Distinguish between near and far sightedness.
8. List three ways in which the eyes may be injured.
9. In what part of the brain is the sensation of vision interpreted?
10. How is the amount of light which enters the eye controlled?

Test 2

Title: *Geological Work of Ice* (Encyclopædia Britannica—Erpi Film)

Type: 16 mm. black-and-white sound.

Time: 11 minutes.

1. What mountain in continental U. S. has a large permanent glacier?
2. How does freezing water aid in breaking up rocks?
3. What causes the apparent "growth" of rocks in New England farm fields?
4. Rock debris accumulating in the front of a glacier is called———.
5. Identify the following terms: (a) cirque, (b) hanging valley, (c) fjord.
6. How many major glacial advances were there during the Pleistocene Epoch?
7. Mention two kinds of glaciers.
8. Why doesn't water in lakes freeze solid to the bottom?
9. How are icebergs formed?
10. What causes glaciers to move?

Test 3

Title: *How the Ear Functions* (Encyclopædia Britannica—Erpi Film)

Type: 16 mm. black-and-white sound.

Time: 11 minutes.

1. How do sound waves compare with ripples on a pound of water?
2. What is the approximate speed of sound?
3. Name the three main divisions of the human ear.
4. What is the principle purpose of the Eustachian tube?
5. ————is an instrument used by the physician in examining the ear.
6. Where in the ear are sound impulses translated into nerve impulses?
7. List the bones of the middle ear.
8. Where in the ear is there a fluid?
9. What organ controls the sense of balance?
10. How do the nerve impulses resulting from sound reach the brain?

Results

Following are the average scores made by the group:

	Average Points
Test 1 (no preparation given before showing)	30.2
Test 2 (note taking required during showing)	18.8
Test 3 (thorough preparation given before showing)	39.5

These scores show clearly that when the class was required to take notes during the film presentation, they made the lowest score—and the differ-

ences are substantial. The average score on Test 2 was only half as high as that on Test 3. When the group was shown the film without previous preparation and without the note taking requirement, they scored 11.4 points higher than they did when they were required to take notes.

In comparing the distribution of the scores, it was interesting to note that 18 students made scores lower than 30.5 points in Test 2, whereas only 12 students made scores lower in Test 1, and 3 students made scores lower than 30.5 in Test 3.

An examination of the notes which the pupils took during the second film shown indicated a direct relationship between their scholarship standing in the class and the quality of the notes. The scores made by many of the students of low scholastic standing in the test following the second film indicate that students of low scholastic standing are particularly handicapped when asked to take notes during a film projection. However, the notes turned in by all members of the class were not of calibre to be of much value to them.

The writer is well aware that this study is not conclusive. Variations in difficulty of film content and in tests have to be considered in interpreting the data. Perhaps more studies will enable us to develop working principles which will result in the more effective utilization of film material in high school science teaching.

Conclusions:

1. The results of the three tests show that the taking of notes during the showing of a film distracts students from concentrating on the key ideas and in making generalizations.

2. Students when properly conditioned and prepared to look for definite things in the film not only learn more from what they see, but are less apt to become discipline problems.

3. The writer would make the following suggestions for showing science films to high school students:

a. Preview the film.

b. Suggest outside reading or other material on the film subject a day or two before the showing.

c. Just before showing the film, present models, charts, maps, or give short demonstrations. Allow students to ask questions. If necessary, put a brief outline on the board. Finally, just before picture is screened remind them that they will be tested shortly after the showing.

d. During the showing it may be necessary to make a comment occasionally to point out something to look for. Keep interruptions at a minimum.

e. After the showing there should be a brief discussion followed by a test.

f. Look for expressed interests which may serve to motivate new projects or fields of study.

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